



Implementation Guidance for the Stage 1 Disinfectants/ Disinfection Byproducts Rule

This document does not substitute for EPA regulation nor is this document regulation itself. Thus, it cannot impose legally-binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances.

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Abbreviations Used in This Document

ASTM: American Society for Testing and Materials
AWWA: American Water Works Association
BAC: Biologically Activated Carbon
BAT: Best Available Technology
CCR: Consumer Confidence Report
CDC: Centers for Disease Control and Prevention
CFE: Combined Filter Effluent
CFR: Code of Federal Regulations
CWS: Community Water System
D/DBP: Disinfectants and Disinfection Byproducts
DBP: Disinfection Byproducts
DBPP: Disinfection Byproducts Precursors
DBPR: Disinfection Byproducts Rule
DOC: Dissolved Organic Carbon
DTF: Data Transfer Format
DWPD: Drinking Water Protection Division
EC: Enhanced Coagulation
EPA: United States Environmental Protection Agency
ES: Enhanced Softening
ESWTR: Enhanced Surface Water Treatment Rule
FACA: Federal Advisory Committee Act
FR: Federal Register
FRDS: Federal Reporting Data System
GAC10: Granular Activated Carbon with ten minute empty bed contact time and 180 day reactivation frequency
GWR: Ground Water Rule
GWUDI: Ground Water Under the Direct Influence of Surface Water
HAA5: Haloacetic Acids (five)(chloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoacetic acid)
HPC: Heterotrophic Plate Count
ICR: Information Collection Rule (issued under section 1412(b) of the SDWA)
IESWTR: Interim Enhanced Surface Water Treatment Rule
Log Inactivation: Logarithm of (N_0/N_T)
Log: Logarithm (common, base 10)
LRAA: Locational Running Annual Average
LT1ESWTR: Long-Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR: Long-Term 2 Enhanced Surface Water Treatment Rule
MCL: Maximum Contaminant Level
MCLG: Maximum Contaminant Level Goal
M-DBP: Microbial and Disinfectants/Disinfection Byproducts
mg/L: Milligrams per Liter
M/R: Monitoring/Reporting
MRDL: Maximum Residual Disinfectant Level

MRDLG: Maximum Residual Disinfectant Level Goal
NIPDWR: National Interim Primary Drinking Water Regulation
nm: nanometers
NPDES: National Pollutant Discharge Elimination System
NPDWR: National Primary Drinking Water Regulation
NSCEP: National Service for Environmental Publications
NTIS: National Technical Information Service
NTNCWS: Non-Transient Non-Community Water System
OAR: Office of Air and Radiation
OECA: Office of Enforcement and Compliance Assurance
OGC: Office of General Counsel
OGWDW: Office of Ground Water and Drinking Water
OMB: Office of Management and Budget
ORC: Office of Regional Counsel
OSWER: Office of Solid Waste and Emergency Response
OW: Office of Water
PWS: Public Water System
PWSS: Public Water Supply Supervision Program
Reg. Neg.: Regulatory Negotiation
SDWA: Safe Drinking Water Act, or the "Act," as amended 1996
SDWIS: Safe Drinking Water Information System
SNC: Significant Non-Compliance
Subpart H: PWS using surface water or ground water under the direct influence of surface water
SUVA: Specific Ultraviolet Absorbance
SW: Surface Water
SWTR: Surface Water Treatment Rule
TCR: Total Coliform Rule
TNCWS: Transient Non-Community Water Systems
TOC: Total Organic Carbon
TT: Treatment Technique
TTHM: Total Trihalomethanes (chloroform, bromdichloromethane, dibromochloromethane, and bromoform)
USGS: United States Geological Survey
UV: Ultraviolet
WTP: Water Treatment Plant
x log removal: Reduction to $1/10^x$ of original concentration

Introduction

This document provides guidance to EPA Regions and states exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) concerning how EPA interprets the Stage 1 Disinfection Disinfectants Byproduct Rule (Stage 1 DBPR) under SDWA. It also provides guidance to the public and the regulated community on how EPA intends to exercise its discretion in implementing the statute and regulations. This guidance is designed to implement national policy on these issues.

The SDWA provisions and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. It does not impose legally-binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA and state decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular facility will be made based on the applicable statutes and regulations. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation, and EPA will consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation based on the law and regulations. EPA may change this guidance in the future.

This manual was developed through a workgroup process involving Regions, states, and stakeholders, and contains the following sections:

Section I summarizes the Stage 1 DBPR and presents a timetable of important dates for this rule. Section II addresses violation determination and associated reporting requirements to assist states in their compliance activities. Section III covers state primacy revision requirements, including a detailed timeframe for application review and approval. This section also contains guidance and references to help states adopt each new special primacy requirement included in these rules. Section IV contains a series of "stand-alone" guidance materials that will help states and public water systems comply with the new requirements.

The Appendices of this document also provide information that will be useful to states and EPA Regions throughout the primacy revision application process. Appendix A contains the primacy revision application crosswalk for the rule. Appendix B contains a sample extension agreement between EPA and a state which will allow the state and EPA to document how they will share rule implementation responsibilities if the state does not submit a primacy application by the deadline. Appendix C contains a "Statement of Principles" which outlines the criteria EPA will use to determine whether states with audit laws have retained adequate enforcement and information gathering authority to meet the requirements of the Safe Drinking Water Act (SDWA). Appendix D contains a Plain English summary of the rule. Appendix E contains the rule language of Stage 1 DBPR incorporating the technical amendments. Appendix F contains sample monitoring forms that can be used as template by states developing their own forms.

EPA and state decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular facility will be made based on the applicable statutes and regulations. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation, and EPA will consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation. EPA may change this guidance in the future.

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Section I.

Rule Requirements

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I-A. The Stage 1 DBPR Executive Summary

Purpose

The purpose of this summary is to acquaint state decision-makers and public health officials with the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The Stage 1 DBPR, published in the *Federal Register* on December 16, 1998 (63 FR 69390; www.epa.gov/OGWDW/mdbp/dbpfr.html; 66 FR 3770; www.epa.gov/safewater/mdbp/iesfr.html; Appendix E—rule language only), is the first part of a series of rules, the “Microbial-Disinfectants/Disinfection Byproducts Cluster” (M-DBP Cluster), to be published over the next several years that are intended to control microbial pathogens while minimizing the public health risks of disinfectants and disinfection byproducts (DBPs). The Stage 1 DBPR specifically addresses risks associated with disinfectants and DBPs. This rule was published concurrently with the Interim Enhanced Surface Water Treatment Rule (IESWTR), which addresses control of microbial pathogens.

Background

The 1974 Safe Drinking Water Act (SDWA) called for EPA to regulate drinking water by creating the national interim primary drinking water regulations (NPDWR). In 1979, the first interim standard addressing DBPs was set for total trihalomethanes (TTHMs), a group of four volatile organic chemicals which form when disinfectants react with natural organic matter in the water.

Although SDWA was amended slightly in 1977, 1979, and 1980, the most significant changes to the 1974 law occurred when SDWA was reauthorized in 1986. Disease-causing microbial contamination had not been sufficiently controlled under the original Act. To safeguard public health, the 1986 Amendments required EPA to set health goals, or maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for 83 named contaminants. EPA was also required to establish regulations within certain time frames, require disinfection of all public water supplies, specify filtration requirements for nearly all water systems that draw their water from surface sources, and develop additional programs to protect ground water supplies.

In 1989, EPA issued two important National Primary Drinking Water Regulations (NPDWR): The Total Coliform Rule (TCR) (40 CFR 141.21) and the Surface Water Treatment Rule (SWTR) (40 CFR 141 Subpart H). The TCR and SWTR 40 CFR 141 Subpart H provide the foundation for the M-DBP Cluster and are summarized below.

The TCR covers all public water systems. Since coliforms are easily detected in water, they are used to indicate a water system's vulnerability to pathogens in the water. In the TCR, EPA set a MCLG of zero for total coliforms. EPA also set a MCL for total coliforms. If more than 5.0 percent of the samples contain coliforms within a month, water system operators must report this violation to the state and the public. In addition, sanitary surveys are required every five or ten years (depending on the quality of the source water) for every system that collects fewer than five samples per month (typically systems that serve less than 4,100 people).

EPA issued the SWTR in response to Congress' mandate requiring disinfection, and where necessary, filtration of systems that draw their water from surface sources before distribution. The SWTR applies to all systems that use surface water or ground water under the direct influence of surface water (GWUDI). The rule sets MCLGs for *Legionella*, *Giardia lamblia*, and viruses at zero since any exposure to these contaminants presents some level of health risk.

Specifically, the rule requires that a surface water system have sufficient treatment to reduce the source water concentration of *Giardia lamblia* and viruses by at least 99.9 percent (3 log) and 99.99 percent (4 log), respectively. A detectable disinfection residual must be maintained throughout the entire distribution system. For systems that filter, the adequacy of the filtration process is determined by measuring the turbidity of the treated water since high levels of turbidity often indicate that the filtration process is not working properly. The goal of the SWTR is to reduce risk to less than one infection per year per 10,000 people. However, the SWTR does not account for systems with high pathogen concentrations that, when treated at the levels required under the rule, still may not meet this health goal, and the rule does not specifically control for the protozoan *Cryptosporidium*.

In 1990, EPA's Science Advisory Board, an independent panel of experts established by Congress, cited drinking water contamination as one of the most important environmental risks and indicated that disease-causing microbial contaminants (*i.e.*, bacteria, protozoa, and viruses) are probably the greatest remaining health-risk management challenge for drinking water suppliers. Data from the Centers for Disease Control (CDC) confirm this concern and indicate that between 1980 and 1994, 379 waterborne disease outbreaks were reported, with over 500,000 cases of disease. During this period, a number of agents were implicated as the cause, including protozoa, viruses, bacteria, and several chemicals. Most of the cases (but not the outbreaks) were associated with surface water, including a single outbreak of cryptosporidiosis in Milwaukee (over 400,000 cases).

In response to these findings, the SDWA was further amended in 1996 to improve public health protection by incorporating new data on the adverse health effects of contaminants, the occurrence of contaminants in public water systems, and the estimated reduction in health risks that would result from further regulation. The Act also increased scientific research requirements and emphasized cost-benefit analyses in the regulatory decision process.

Based on prevailing scientific data, the M-DBP Cluster is intended to control microbial pathogens while minimizing the public health risk from disinfectants and DBPs. Since multiple threats require multiple barriers, the IESWTR and Stage 1 DBPR expand on the foundation of the TCR, SWTR, and TTHM standards to target health risk outliers unaddressed by prior regulations.

The TTHM NPDWR of 1979 set a standard for TTHMs only for public water systems (PWSs) serving 10,000 or more people. The Stage 1 DBPR builds on the TTHM Rule by lowering the MCL and widening the range of affected systems to include all PWSs that add a disinfectant. Therefore, EPA believes that the promulgation of the Stage 1 DBPR will significantly decrease the risks posed by DBPs and disinfectants by covering many PWSs not currently regulated for TTHM or other DBPs.

Many water systems treat their water with a chemical disinfectant in order to inactivate pathogens that cause disease. The public health benefits of common disinfection practices are significant and well-recognized; however, disinfection poses risks of its own. While disinfectants are effective in controlling many harmful microorganisms, they react with organic and inorganic matter (disinfection byproduct precursors—DBPPs) in the water and form DBPs, some of which pose health risks at certain levels. Since the discovery of chlorination byproducts in drinking water in 1974, numerous toxicological studies have been conducted that show some DBPs to be carcinogenic and/or cause reproductive or developmental effects in laboratory animals. Additionally, exposure to high levels of disinfectants over long periods of time may cause health problems, including damage to blood and kidneys. While many of these studies have been conducted at high doses, the weight-of-evidence indicates that DBPs present a potential public health problem that must be addressed. One of the most complex questions facing water supply professionals is how to reduce risks from disinfectants and DBPs while providing increased protection against microbial contaminants. Much of the population is exposed to these risks; therefore, a substantial concern exists.

To address this concern, the Stage 1 DBP Rule updates and supersedes the 1979 TTHM standard by lowering the MCL for TTHMs and establishing maximum residual disinfection level (MRDL) limits for chlorine, chloramines, and chlorine dioxide and new MCLs for chlorite, bromate, and haloacetic acids (HAA5) for all community water systems and nontransient noncommunity water systems that add a chemical disinfectant for either primary or residual treatment. In addition, the Stage 1 DBP Rule requires conventional filtration systems to remove specified percentages of organic materials measured as total organic carbon (TOC) that may react with disinfectants to form DBPs.

By building on the foundation set forth by the original SDWA, the quality of drinking water has improved and public health protection has increased. The IESWTR and Stage 1 DBP Rules are part of a series of rules designed to expand on the foundation of prior rulemaking efforts. By encompassing previously unaddressed health risks from microbials and disinfection byproducts, the M-DBP Cluster continues to maximize drinking water quality and public health protection.

Development of the Stage 1 DBPR

The new rules are a product of 6 years of collaboration among the water supply industry, environmental and public health groups, and local, state, and federal governments. EPA first launched a rule-making process in 1992 and convened a Regulatory Negotiation (RegNeg) Advisory Committee under the Federal Advisory Committee Act (FACA), representing a range of stakeholders affected by possible regulation. The 1996 SDWA Amendments required EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts.

In 1997, a similar FACA process was implemented with the Microbial-Disinfectants/Disinfection Byproducts (M-DBP) Advisory Committee. The M-DBP Committee convened to collect, share, and analyze new information available since 1994, review previous assumptions made during the RegNeg process, as well as build consensus on the regulatory implications of this new information. Negotiations resulted in the following three proposals:

- A staged approach to regulation of DBPs (referred to as the Stage 1 and Stage 2 DBPRs) incorporating Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs), and treatment technique requirements;
- A companion Interim Enhanced Surface Water Treatment Rule (IESWTR) designed to improve control of microbial pathogens and prevent inadvertent reductions in microbial safety as a result of DBP control efforts; and,
- An Information Collection Rule (ICR) to collect information necessary to reduce many key uncertainties prior to subsequent negotiations for the Stage 2 DBPR.

Benefits of the Stage 1 DBPR

The Stage 1 DBPR is expected to reduce the risks associated with exposure to disinfectants and DBPs. The MCLs will reduce exposure to specific DBPs from the use of ozone (byproduct: bromate), chlorine dioxide (byproduct: chlorite), and chlorine (byproducts: TTHM and five Haloacetic Acids—(HAA5)). In addition, the implementation of a treatment technique (enhanced coagulation/ enhanced softening) will reduce overall exposure to the broad range of non-specified DBPs. In the Regulatory Impact Analysis for the Stage 1 DBPR, EPA estimated that the rule will result in a national annual average reduction in TTHM levels of 24 percent. As many as 140 million people will have increased protection from DBPs and their potential health risks, including bladder cancer and adverse developmental and reproductive health effects.

Applicability and Compliance Dates

The existing TTHM requirements apply only to systems serving 10,000 or more people. The Stage 1 DBPR covers a larger number of PWSs, applying to community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process. In addition, certain requirements apply to transient noncommunity water systems (TNCWSs) that use chlorine dioxide.

Subpart H systems (PWSs that use surface water or ground water under the direct influence of surface water—GWUDI—as a source) serving 10,000 or more people must comply with the requirements of the Stage 1 DBPR beginning January 1, 2002. States can grant up to 24 additional months for capital improvements for Subpart H systems serving 10,000 or more people. This extension extends the compliance date for meeting the MCL, but the system must monitor as required by the rule and report the results of any detected Stage 1 DBPR contaminants in their CCR. Since the system would not be in violation of the MCL, public notification would not be required. Subpart H systems that serve fewer than 10,000 people, and all affected ground water systems, must comply with the requirements beginning January 1, 2004.

Requirements of the Rule: Public Water Systems

MCLGs and MCLs for disinfection byproducts

The Stage 1 DBPR sets maximum contaminant level goals (MCLGs) for some of the regulated DBPs, sets a more stringent maximum contaminant level (MCL) for TTHM, and sets new MCLs for HAA5, bromate, and chlorite. MCLGs are non-enforceable public health goals set at concentrations to which no known or anticipated adverse health effects are expected to occur with an adequate margin of safety. MCLs are enforceable contaminant standards that are feasible to achieve.

Disinfection Byproduct	MCLG (mg/L)	MCL (mg/L)
Total Trihalomethanes (TTHM)		0.080
Chloroform		
Bromodichloromethane	zero	
Bromoform	zero	
Dibromochloromethane	0.06	
Five Haloacetic Acids (HAA5)		0.060
Monochloroacetic Acid		
Dichloroacetic Acid	zero	
Trichloroacetic Acid	0.3	
Monobromoacetic Acid		
Dibromoacetic Acid		
Chlorite	0.8	1.0
Bromate	zero	0.010

Compliance for TTHM and HAA5 MCLs is based on a running annual arithmetic average, computed quarterly, of quarterly averages of all samples. Compliance for the chlorite MCL is based on an arithmetic average of each three sample set taken in the distribution system. Compliance for the bromate MCL is based on a running annual arithmetic average, computed quarterly, of monthly samples.

MRDLGs and MRDLs for disinfectant residuals

To protect against potential health risks caused by high levels of residual disinfectants, the Stage 1 DBPR sets the following maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs). Like MCLGs and MCLs, respectively, MRDLGs are non-enforceable, while MRDLs are enforceable.

Disinfectant	MRDLG (mg/L)	MRDL (mg/L)
Chlorine	4 (as Cl ₂)	4.0 (as Cl ₂)
Chloramines	4 (as Cl ₂)	4.0 (as Cl ₂)
Chlorine Dioxide	0.8 (as ClO ₂)	0.8 (as ClO ₂)

Systems using chlorine or chloramines may temporarily increase residual disinfectant levels to an appropriate level protect to public health in order to address specific microbiological contamination problems. These problems may be caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events. This option is NOT available for the use of chlorine dioxide.

Compliance for chlorine and chloramine MRDLs is based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples. Compliance for the chlorine dioxide MRDL is based on consecutive daily samples.

Treatment technique for disinfection byproduct precursors

The rule includes a treatment technique that applies to Subpart H systems using conventional filtration technology. The treatment technique was established because disinfectants can react with disinfection byproduct precursors (DBPPs) to form both regulated and non-regulated DBPs. The treatment technique requirements in the rule are designed to provide public health protection by minimizing the production of all DBPs. Compliance with the rule's treatment technique requirement can be achieved by removing specified percentages of Total Organic Carbon (TOC) using enhanced coagulation or enhanced softening. Alternatively, systems are compliant by showing they meet alternative performance criteria.

Best available technology (BAT)

EPA has specified the Best Available Technology (BAT) for each MCL and MRDL established in the rule. These technologies and methods are believed to be effective in controlling chemicals in drinking water while remaining economically feasible for PWSs to employ. PWSs must use the specified BAT if they wish to qualify for variances.

Chemical		Best Available Technology
DBPs	TTHM and HAA5	Enhanced coagulation or granular activated carbon (GAC 10), with chlorine as the primary and residual disinfectant
	Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels
	Bromate	Control of ozone treatment process to reduce production of bromate
Disinfectants	Chlorine, chloramine, and chlorine dioxide	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

Public water system recordkeeping and reporting requirements

For each disinfectant, contaminant, contaminant group, and treatment technique, EPA has developed routine compliance monitoring schemes to be protective of acute and chronic health concerns. The compliance monitoring requirements vary by the size and type of system, the treatment employed, and the disinfectant used. In many cases, systems may reduce monitoring frequencies after establishing a baseline that shows violations are unlikely.

Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which the samples were collected. Those required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. Systems that are required to conduct additional monitoring because of the disinfectant used (e.g., chlorine dioxide) are subject to additional reporting requirements if certain chemical levels are measured.

Laboratory methods and certification

The rule specifies analytical methods for measuring each relevant water quality parameter, disinfectant, contaminant, and DBPP. Consistent with current regulations, only certified laboratories can analyze samples for compliance with the MCLs with the exception of the daily measurement of chlorite at the entrance to the distribution system. For the daily measurement of chlorite, disinfectants and other specified parameters that EPA believes can be adequately measured by other than certified laboratories, and for which there is good reason to allow on-site analysis (e.g., for samples that may deteriorate before reaching a certified laboratory), EPA is requiring that analyses be conducted by a party approved by the state.

Requirements of the Rule: States or Other Primacy Agents

State primacy, recordkeeping, and reporting requirements

The Stage 1 DBPR requires states to adopt several new regulatory requirements including public notification requirements, MCLs for DBPs, MRDLs for disinfectants, and the requirements of Subpart L. In addition, states are required to adopt special primacy requirements and keep records of their activities, records of decisions, and PWS monitoring results. State reporting to EPA is covered under existing regulation.

More information can be obtained from:

- ☞ The Stage 1 Disinfectants/Disinfection Byproducts Rule
63 FR 69390 (December 16, 1998)
www.epa.gov/OGWDW/mdbp/dbpfr.html
- ☞ The Stage 1 Disinfectants/Disinfection Byproducts Rule:
Technical Corrections
66 FR 3770 (January 16, 2001)
www.epa.gov/safewater/mdbp/iesfr.html
- ☞ The EPA Safe Drinking Water Hotline, Telephone:
1.800.426.4791

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I-B. Key Dates for the Stage 1 DBPR

The compliance dates for the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) are January 1, 2002 and January 1, 2004. Surface water systems and systems using ground water under the direct influence (GWUDI) of surface water that serve 10,000 or more people (large subpart H systems) will have to comply with the provisions of the rule beginning January 1, 2002. Surface water and GWUDI systems that serve fewer than 10,000 people (small subpart H systems) and all ground water systems will have to comply with the provisions of the rule beginning January 1, 2004. The timetable for the Stage 1 DBPR is presented in Table I-1.

Table I-1: Timetable for the Stage 1 DBPR Requirements

Date	DBPR Requirement
December 16, 1998	Rule is published in <i>Federal Register</i> [63 FR 1 69390].
February 16, 1999	60-day legal challenge period ends.
February 16, 1999	Methods specified in §141.131 for analyzing disinfection byproducts, disinfection residuals, and DBP precursors are approved for use [40 CFR 141.131(a)].
December 16, 2000	Final primacy applications must be submitted to EPA unless granted an extension [40 CFR 142.12(b)(1)].
January 1, 2001	Large Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2002	Large Subpart H TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65(b)(2)].
January 1, 2002	Requirements of Subpart L generally apply to large Subpart H CWSs and NTNCWs [40 CFR 141.130(b)(1)]. <ul style="list-style-type: none"> • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
December 16, 2002	Final primacy revisions applications with approved extensions must be submitted to EPA [40 CFR 142.12(b)(2)].
January 1, 2003	Small Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
December 31, 2003	Systems which received an extension from the state to install GAC or membranes must comply with the Stage 1 DBPR [40 CFR 141.64(b)(2)].
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].

Date	DBPR Requirement
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2004	Small Subpart H and all ground water TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65 (b)(2)].
January 1, 2004	<p>Requirements of Subpart L generally apply to small Subpart H and all ground water CWSs and NTNCWs [40 CFR 141.130(b)(1)].</p> <ul style="list-style-type: none"> • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
June 30, 2005	Systems that made a clear and irrevocable financial commitment before the applicable compliance date to install technologies that limit TTHM and HAA5 to 0.040 mg/L and 0.030 mg/L, respectively, must have these technologies installed and operating. [40 CFR 141.135(a)(2)(iii)].

Section II.

SDWIS Reporting and SNC Definitions

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II-A. Safe Drinking Water Information System (SDWIS) Reporting Under the Stage 1 DBPR

SDWIS/FED (Safe Drinking Water Information System/Federal version) is an EPA national database storing routine information about the nation's drinking water. Designed to replace the system known as FRDS (Federal Reporting Data System), SDWIS/FED stores the information EPA needs to monitor approximately 175,000 public water systems.

States supervise the drinking water systems within their jurisdictions to ensure that each public water system meets state and EPA standards for safe drinking water. The Safe Drinking Water Act (SDWA) requires states to report drinking water information periodically to EPA; this information is maintained in SDWIS/FED.

States report the following information to EPA:

- Basic information on each water system, including: name, ID number, number of people served, type of system (year-round or seasonal), and source of water (ground water or surface water)
- Violation information for each water system: whether it has followed established monitoring and reporting schedules, complied with mandated treatment techniques, or violated any Maximum Contaminant Levels (MCLs)
- Enforcement information: what actions states have taken to ensure that drinking water systems return to compliance if they are in violation of a drinking water regulation
- Sampling results for unregulated contaminants and for regulated contaminants when the monitoring results exceed the MCL

EPA uses this information to determine if and when it needs to take action against non-compliant systems, oversee state drinking water programs, track contaminant levels, respond to public inquiries, and prepare national reports. EPA also uses this information to evaluate the effectiveness of its programs and regulations, and to determine whether new regulations are needed to further protect public health.

II-A.1 Federally Reported Violations

Under SDWIS/FED reporting, states only report when violations occur. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule, whether included in the accompanying table or not, is a basis for a state or federal enforcement action.

Table II-1 summarizes the violation and contaminant codes that will be used to report violations of the Stage 1 DBPR to SDWIS/FED.

Table II-1: SDWIS/FED Codes for Federal Reporting Under the Stage 1 DBPR

Violation Code	Contaminant Code	MCL and MRDL Violations
02	1009	Chlorite
	1011	Bromate
	2456	Haloacetic Acids
	2950	Total Trihalomethanes
11 ¹	1006	Chloramines
	1008	Chlorine Dioxide (Acute and Non-Acute)
	0999	Chlorine
		Treatment Technique (TT) Violations
37	0400	Failure to submit/obtain state approval for significant treatment modifications
12	0400	Failure to have qualified operator
46	2920	Failure to meet DBP precursor removal (TOC)
		Monitoring and Reporting (M/R) Violations
27 ²	0400	Major: Failure to develop, implement, or submit monitoring plan
	1011	Major: Failure to collect and report 100% of required bromate samples
	2920	Major: Failure to collect source and finished water TOC/alkalinity samples
	appropriate MCL/MRDL contaminant code	Major: Failure to collect and report at least 90% of required samples (except for bromate)
		Minor: Collecting and reporting between 90-99% of required samples (except for bromate)
		Public Notification (PN) Violations*
06	appropriate MCL/MRDL/ TOC contaminant code	Failure to notify public after a violation

* The revised PN rule (65 FR 25981) is effective May 6, 2002 and will supercede the PN violation listed above.

Table II-2 contains the federally reportable violations for the Stage 1 DBPR in more detail. These violations are listed by contaminant or requirement and violation type. The table includes the SDWIS/FED reporting codes, the regulatory citation, system type affected, a detailed description of the violation, and the initial compliance date. This table will allow a user to better understand violations listed in SDWIS. For more information on how to report Stage 1 DBPR violations to SDWIS, please refer to the *State Reporting Guidance for the Stage 1 Disinfectants and Disinfection Byproducts Rule* which will be available at www.epa.gov/safewater/mdbp/implement.html in fall 2001.

¹Flag used to denote acute or non-acute for chlorine dioxide

²Flag used to denote major or minor.

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Table II-2: Federally Reported Violations for the IESWTR

MCL Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
02/1011	Bromate	§141.64(a)	MCL	All systems using ozone for disinfection or oxidation	If the running annual average computed quarterly of monthly samples exceeds the MCL 0.010 mg/L	January 1, 2002 January 1, 2004
02/1009	Chlorite	§141.64(a)	MCL	All systems using chlorine dioxide for disinfection or oxidation	If the average of any three sample set, exceeds the MCL of 1.0 mg/L.	January 1, 2002 January 1, 2004
02/2456	HAA5	§141.64(a)	MCL	All systems	If the running annual average computed quarterly of quarterly averages of available samples exceed 0.060 mg/L for HAA5	January 1, 2002 January 1, 2004
02/2950	TTHM	§141.64(a)	MCL	All systems	If the running annual average computed quarterly of quarterly averages of available samples exceed 0.080 mg/L for TTHM	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

MRDL Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
11/1006	Chloramines	§141.65(a)	MRDL	All systems using chloramines - If systems use both chloramines and chlorine, systems must average all results for compliance	If the annual average, computed quarterly, of monthly averages exceeds 4.0 mg/L (unless increased residual levels in the distribution system address specific microbial contamination problems)	January 1, 2002 January 1, 2004
11/0999	Chlorine	§141.65(a)	MRDL	All systems using chlorine - If systems use both chloramines and chlorine, systems must average all results for compliance	Exceedance of the MRDL for Chlorine: 4.0 mg/L (unless increased residual levels in the distribution system address specific microbial contamination problems)	January 1, 2002 January 1, 2004
11/1008 Acute/Non Acute	Chlorine Dioxide	§141.65(a)	MRDL	All systems using chlorine dioxide for disinfection or oxidation	ACUTE : If any of the three required distribution samples taken on the day following a daily entry point sample MRDL exceedance 0.8 mg/L NON-ACUTE: If any two consecutive daily samples exceed 0.8 mg/L and all distribution samples are less than 0.8 mg/L	January 1, 2002 January 1, 2004
11/1008 Acute/Non Acute	Chlorine Dioxide	§141.132(a)	MRDL	All systems using chlorine dioxide for disinfection or oxidation	Failure to collect and report additional samples the day following and MRDL exceedance This is specified in the rule as a MRDL violation.	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Public Notification (Note: The revised PN Rule supercedes §141.32)						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
06/1011 06/1006 06/0999 06/1008 06/1009 06/2456 06/2920 06/2950	Bromate Chloramines Chlorine Chlorine Dioxide Chlorite HAA5 DBP Precursors (TOC) TTHM	§141.32(e)	PN	All systems	Failure to provide timely public notice using the required language for violations of MCLs, MRDLs, treatment techniques, or variance/exemption schedules, and/or failure to give a copy of the most recent PN for any outstanding violation of any MCL, MRDL, treatment technique, or variance/exemption schedule to all billing units or new hookups prior to or at the time service begins	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Treatment Technique Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
37/0400	TTHM	§141.30(f)	TT	All Subpart H systems that add disinfectant	Failure to submit and obtain state approval of a plan detailing significant treatment process modifications prior to making such modifications	February 1999
12/0400	Treatment Plant Operators	§141.130(c)	TT	All CWSs and NTNCWSs which add a chemical disinfectant	Failure to have a state-approved and listed qualified operator running the plant	January 1, 2002 January 1, 2004
46/2920	DBP Precursors (TOC)	§141.135	TT	All Subpart H systems that use conventional filtration	Failure to meet the Treatment Technique requirements for DBP precursor removal	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
27/0400	Monitoring Plan	§141.132(a)(3)	M/R Major	All CWSs and NTNCWSs which add a chemical disinfectant	Failure to develop, within thirty days of the initial compliance dates, implement and monitor in accordance with the monitoring plan.	January 1, 2002 January 1, 2004
27/0400	Monitoring Plan	§141.132(f) §141.134(a)	M/R Major	Subpart H Systems serving over 3,300 people	Failure to submit a copy of the monitoring plan to the state no later than the date of the first report required under §141.34	January 1, 2002 January 1, 2004
27/1006	Chloramines	§141.132(c)(1)	M/R Major	All systems using chloramines	Failure to collect and report <i>at least</i> 90 percent of samples (taken at same time and location as total coliform samples), failure to monitor using the EPA-approved monitoring & analytical methods and certified labs, and/or failure to report within 10 days after the end of the applicable reporting period.	January 1, 2002 January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent, or Failure to monitor using the EPA-approved monitoring & analytical methods and certified labs, and report between <u>90% and 99% of all required results and information within 10 days</u> after the end of the applicable reporting period, for the applicable contaminant.	

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
27/1011	Bromate	§141.132(b)(3)	M/R Major	All systems using ozone for disinfection or oxidation	Failure to collect and report 100% of required samples: 1/month/plant on routine monitoring or 1/plant/quarter on reduced monitoring (system must revert to routine if running annual ave. source water bromide \geq 0.05mg/L)	January 1, 2002 January 1, 2004
27/0999	Chlorine	§141.132(c)(1)	M/R Major M/R Minor	All systems using chlorine	Failure to collect and report <i>at least</i> 90 percent of samples (taken at same time and location as total coliform samples) Collecting and reporting between 90 - 99 percent.	January 1, 2002 January 1, 2004
27/1008	Chlorine Dioxide	§141.132(c)(2)	M/R Major M/R Minor	All systems using chlorine dioxide for disinfection or oxidation - systems may not reduce chlorine dioxide monitoring	Failure to collect and report <i>at least</i> 90 percent of required samples. Collecting and reporting between 90 - 99 percent.	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
SDWIS Violation and Contaminant Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
27/1009	Chlorite	§141.132(b)(2)	M/R Major	All CWS and NTNCWS using chlorine dioxide for disinfection or oxidation - systems may not reduce daily Chlorite, but can reduce monthly three sample set in distribution system to quarterly. Systems must revert to routine if any distribution sample exceeds MCL of 1.0mg/L.	Failure to collect and report <i>at least</i> 90 percent of daily samples at the entrance to the distribution system and monthly three set samples in distribution system.	January 1, 2002 January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent.	
27/2920	DBP Precursors	§141.132(d)(1)	M/R Major	All Subpart H systems that use conventional filtration - Systems can remain on reduced monitoring as long as annual average treated TOC does not exceed 2.0 mg/L	Failure to collect source and finished water TOC samples and Alkalinity sample (at the same time as source water TOC sample) - 1/month/plant on routine monitoring or 1/quarter/ Plant on reduced monitoring.	January 1, 2002 January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

TTHM/HAA5 Monitoring and Reporting Violations by System Size

Monitoring and Reporting Violations Subpart H serving at least 10,000 people					
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Subpart H serving at least 10,000 people - Systems on reduced must revert to routine if annual average exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5	Failure to collect and report <i>at least</i> 90 percent of required samples: Routine = 4/quarter/plant Reduced = 1/quarter/plant
			M/R Minor		Collecting and reporting between 90 - 99 percent of required samples
Monitoring and Reporting Violations Subpart H serving 500 to 9,999 people					
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Subpart H serving 500 to 9,999 people - Systems on reduced must revert to routine if annual average exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5	Failure to collect and report <i>at least</i> 90 percent of required samples: Routine = 1/quarter/plant Reduced = 1/year/plant during month of warmest water temperature
			M/R Minor		Collecting and reporting between 90 - 99 percent of required samples.
Monitoring and Reporting Violations Subpart H serving fewer than 500 people					
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Subpart H serving fewer than 500 people - There is no reduced monitoring	Failure to collect and report <i>at least</i> 1 sample per plant per year during the month of warmest water temperature
					January 1, 2004

This chart contains the federally reportable violations for the Stage 1 DBPR. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation of the rule is a basis for a state or federal enforcement action.

Monitoring and Reporting Violations						
Ground water serving at least 10,000 people						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Ground water serving at least 10,000 people - Systems on reduced must revert to routine if the annual average exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5	Failure to collect and report <i>at least</i> 90 percent of required samples: Routine = 1/quarter/plant Reduced = 1/year/plant during the month of warmest water temperature	January 1, 2004
			M/R Minor		Collecting and reporting between 90 - 99 percent of required samples	
Monitoring and Reporting Violations						
Ground water serving fewer than 10,000 people						
27/2456 27/2950	HAA5 TTHM	§141.132	M/R Major	Ground water serving fewer than 10,000 people - If any sample exceeds 0.060 mg/L for TTHM or 0.045 mg/L HAA5 system must increase to quarterly monitoring	Failure to collect and report <i>all required samples</i> : Routine = <i>at least</i> 1 sample per plant per year during the month of warmest water temperature Reduced = <i>at least</i> 1 sample per plant per 3-year cycle	January 1, 2004

II-B. SNC Definitions for the Stage 1 DBPR

Significant noncompliers (SNCs) are community, non-transient non-community and transient non-community water systems that have more serious, frequent, or persistent violations. The criteria which designate a system as a SNC vary by contaminant. Once a system is designated as a SNC, it is subject to EPA's timely and appropriate policy. SNCs that have not returned to compliance or are not addressed timely and appropriately are called Exceptions. Timeliness for SNCs is eight months after the system became a SNC. (Two months for the state to determine, and become aware of, the system's SNC status and six months in which to complete the follow-up/enforcement action). The types of actions considered appropriate include the issuance of a formal state or federal administrative or compliance order, a civil or criminal referral to state Attorney General or Department of Justice, or state bilateral compliance agreement signed by both the state and the violator.

The following are SNC definitions for the Stage 1 DBPR. The requirements of the Stage 1 DBPR prescribe different monitoring frequencies depending on the constituent (e.g. chlorine, TTHM/HAA5, TOC). The following definition categorizes SNC based on the frequency of monitoring. In many cases, a system will be monitoring at multiple frequencies (i.e. monthly sampling for TOC and chlorine, quarterly for TTHM and HAA5). To determine if a system is a SNC, the violations for like monitoring frequencies are added together. For example, System A received a MRDL violation for chlorine (monthly monitoring), one treatment technique violations for DBP precursors (monthly monitoring), and two major M/R violations for failing to collect all monthly TOC monitoring. System A has triggered the quarterly SNC definition.

MONTHLY (or more frequent) MONITORING (excluding chlorine dioxide)

- A system that has a combination of four (4) or more MCL or MRDL violations in any 12 consecutive months.
- A system that has a combination of six (6) or more MCL or MRDL violations and Major M/R violations in any 12 consecutive months.
- A system that has a combination of ten (10) or more MCL or MRDL violations, Major M/R violations, and Minor M/R violations in any 12 consecutive months.

QUARTERLY MONITORING

- A system that has a combination of two (2) or more MCL violations, MRDL violations, TT violations, and Major M/R violations in any 12 consecutive months.
- A system that has a combination of three (3) or more MCL violations, MRDL violations, TT violations, Major M/R violations, and Minor M/R violations in any 12 consecutive month.

YEARLY OR LESS MONITORING

- A system which fails to collect and report all required sample(s).

Note: A system which has one (1) MCL violation in any compliance cycle converts to quarterly monitoring (§141.133(b)(1)(ii)). Please refer to SNC definition for systems monitoring quarterly.

CHLORINE DIOXIDE:

- A system that has four (4) non-acute chlorine dioxide violations in any 12 consecutive months.
- A system that has one (1) acute chlorine dioxide MRDL violation in any 12 consecutive months.

TTHM

- Failure to obtain state approval before making any significant modification to its existing treatment process (§141.30(f)).

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Section III.

State Primacy Revision Applications

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Changes to the Primacy Revision Process

40 CFR 142 sets out requirements for states to obtain and/or retain primary enforcement responsibility (primacy) for the Public Water System Supervision (PWSS) program as authorized by §1413 of the Safe Drinking Water Act (SDWA). The 1996 SDWA Amendments create an additional requirement and modify the process for states to obtain and/or retain primacy. On April 28, 1998, EPA promulgated the Primacy Rule to reflect these statutory changes (63 FR 23361).

For consistency with the Amendments to §1413, the Primacy Rule makes the following changes to the existing regulations in 40 CFR 142:

- 1) **Administrative Penalty Authority**—As a condition of primacy, states must now have administrative penalty authority for all violations of their approved primacy program, unless prohibited by the states' constitution. This encompasses applicable requirements in 40 CFR 141 and 142 including, but not limited to, National Primary Drinking Water Regulations, variances and exemptions, if applicable, and public notification requirements.
- 2) **Interim Primacy**—The Primacy Rule also codifies the new process which grants primary enforcement authority to states while their applications to modify their primacy programs are under review (interim primacy). New section 142.12(e) explains that any state already having primacy for all existing national primary drinking water regulations in effect when a new regulation is promulgated is considered to have interim primacy for a new or revised regulation, once it has submitted a complete and final primacy revision application. This interim enforcement authority begins on the date of submission of a complete and final primacy revision application or the effective date of the new or revised state regulation, whichever is later, and ends when EPA makes a final determination.
- 3) **Time increases for rule adoptions**—The rule also increases the time for a state to adopt new or revised federal regulations from 18 months to 2 years.
- 4) **Examples of emergencies**—Finally, the Primacy Rule adds examples of circumstances that require an emergency plan for the provision of safe drinking water. Emergencies include earthquakes, floods, hurricanes, and other natural disasters.

For consistency with the Amendments to §1401(4), the Primacy Rule expands the definition of a public water system (PWS) to include not only systems which provide water for human consumption through pipes, but also systems which provide water for human consumption through "other constructed conveyances."

III-A. State Primacy Program Revision

Pursuant to §142.12, **Revision of State Programs**, complete and final requests for approval of program revisions to adopt new or revised EPA regulations must be submitted to the Administrator no later than 2 years after promulgation of the new or revised federal regulations (see Table III-1). Until those applications are approved, EPA Regions have responsibility for directly implementing the IESWTR and the Stage 1 DBPR. The state and EPA can agree to implement the rule together during this period. However, if a state is eligible for interim primacy, once it submits a complete and final revision package, it will have full implementation and enforcement authority. A state may be granted additional time, up to two years, to submit its application package. During this period, an extension agreement outlining the state's and EPA's responsibilities is required.

Table III-1: State Rule Implementation and Revision Timetable

EPA/State Action	Time Frame
Rules published by EPA	December 16, 1998
State and Region establish a process and agree upon a schedule for application review and approval	May 1999
State, at its option, submits draft program revision package including: Preliminary Approval Request Draft state Regulations and/or Statutes Regulation Crosswalk	September 1999 (Suggested)
Regional (and Headquarters if necessary) review of draft	Completed within 90 days of state submittal of Draft
State submits final program revision package including: Adopted state Regulations Regulation Crosswalk 40 CFR 142.10 Primacy Update Checklist 40 CFR 142.14 and 142.15 Reporting and Recordkeeping 40 CFR 142.16 Special Primacy Requirements Attorney General's Enforceability Certification	By September 16, 2000*
EPA final review and determination: Regional review (program and ORC) Headquarters concurrence and waivers (OGWDW, OECA, OGC) Public Notice Opportunity for hearing EPA's Determination	Completed within 90 days of state submittal of final 45 days Region 45 days Headquarters
Rule Effective Date	Systems serving $\geq 10,000$ people January 1, 2002 Systems serving $\leq 10,000$ people January 1, 2004

* EPA suggests submitting an application by September 2000, to ensure timely approval. EPA regulations allow until December 16, 2000 for this submittal. An extension of up to 2 additional years may be requested by the state.

III-A.1 The Revision Process

The approval of state program revisions is recommended to be a two-step process comprised of submission of a draft request (optional) and then submission of a complete and final request for program approval. Figure III-1 diagrams these processes and their timing.

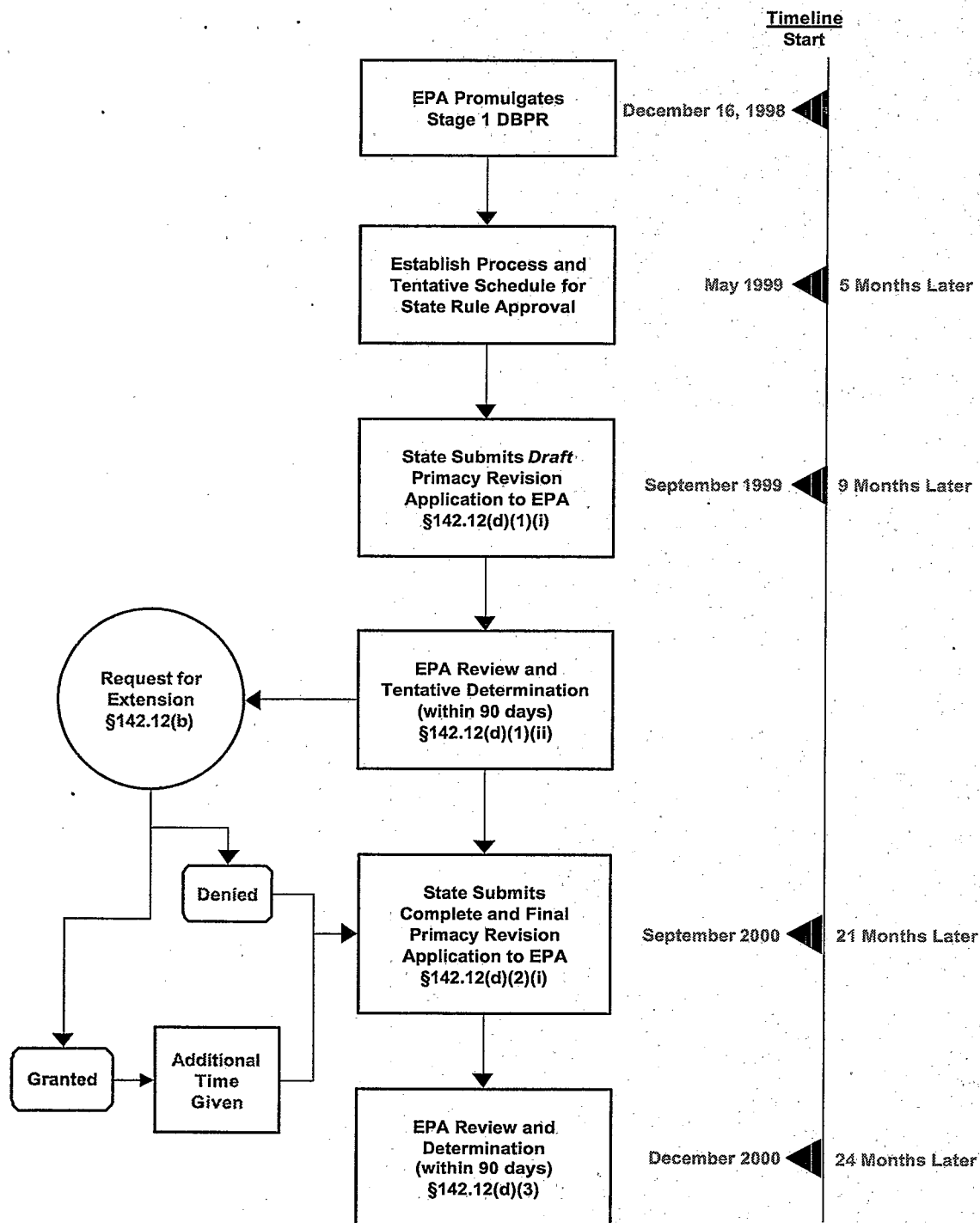
Draft Request—At the state's option, it may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials. A draft request should be submitted by 9 months after rule promulgation. EPA will make a tentative determination on whether the state program meets the applicable requirements. The tentative determination should be made within 90 days.

Complete and Final Request—This submission must be in accordance with §142.12(c)(1) and (2) and include the Attorney General's statement. If the state has submitted a draft request for EPA review, the state must address any comments and/or program deficiencies identified in the tentative determination in their final submission. Regions should make states aware that submission of only a final request may make it more difficult for the states to address any necessary changes within the allowable time for state rule adoption.

EPA requests that states submit their complete and final revision package within 21 months of rule promulgation. This will ensure that states will have interim primacy within 24 months and will prevent states from becoming backlogged with revision applications to adopt future federal requirements.

The state and Region should agree to a plan and timetable for submitting the state primacy revision application as soon as possible after rule promulgation—ideally within 5 months of promulgation.

Figure III-1: Recommended Review Process for State Request for Approval of Program Revisions



III-A.2 The Final Review Process

Once a state application is complete and final, EPA has a regulatory (and statutory) deadline of 90 days to review and approve or disapprove of the revised program. The Offices of Ground Water and Drinking Water (OGWDW) and Enforcement and Compliance Assurance (OECA) will conduct detailed reviews of the first state package from each Region. The Region should submit their comments with the state's package for Headquarters' review. When the Region has identified all significant issues, OGWDW and OECA will waive concurrence on all other state programs in that Region, although HQ will retain the option to review additional state programs with cause. The Office of General Counsel (OGC) has delegated its review and approval to the Office of Regional Counsel (ORC).

In order to meet the 90 day deadline for packages undergoing Headquarters' review, the review period will be equally split giving both the Regions and Headquarters 45 days to conduct their respective reviews. For the first package in each Region, Regions should forward copies of the primacy revision applications and their comments to the director of the Drinking Water Protection Division (DWPD) in OGWDW. The DWPD Director will take the lead on the review process. OGWDW will provide OECA with a copy for their concurrent review. OECA will concur on OGWDW approvals.

III-B. State Primacy Program Revision Extensions (40 CFR 142.12 (b))

III-B.1 The Extension Process

Under §142.12(b), states may request that the 2-year deadline for submitting the complete and final request for EPA approval of program revisions be extended for up to 2 additional years in certain circumstances. The extension request must be submitted to EPA within 2 years of the date that EPA published the regulation. The Regional Administrator has been delegated authority to approve extension applications. Headquarters concurrence on extensions is not required.

III-B.2 Criteria that an Extension Request Must Meet

For an extension to be granted under § 142.12 (b), the state must demonstrate that it is requesting the extension because it cannot meet the original deadline for reasons beyond its control, despite a good faith effort to do so. A critical part of the extension application is the state's proposed schedule for submission of its complete and final request for approval of a revised primacy program. The application must also demonstrate at least one of the following:

- (i) That the state currently lacks the legislative or regulatory authority to enforce the new or revised requirements; or,
- (ii) That the state currently lacks the program capability adequate to implement the new or revised requirements; or,
- (iii) That the state is requesting the extension to group two or more program revisions in a single legislative or regulatory action.

In addition, the state must be implementing the EPA requirements to be adopted in its program revision within the scope of its current authority and capabilities.

III-B.3 Conditions of the Extension

If an extension is granted, the Region and state will negotiate certain conditions that must be met during the extension period. These conditions will be determined during the extension approval process and are decided on a case-by-case basis. The conditions must be included in an extension agreement between the state and the EPA Regional office. Appendix B contains a sample extension agreement.

Conditions of an extension agreement may include:

- Informing PWSs of the new EPA (and upcoming state) requirements and that the Region will be overseeing implementation of the requirements until they approve the state program revisions or until the state submits a complete and final revision package if the state qualifies for interim primacy;
- Collecting, storing and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations;
- Assisting the Region in the development of the technical aspects of enforcement actions and conducting informal follow-up on violations (telephone calls, letters, etc.);
- Providing technical assistance to public water systems;
- For states whose request for an extension is based on a current lack of program capability adequate to implement the new requirements, taking steps agreed to by the Region and the state during the extension period to remedy the deficiency;
- Providing the Region with all the information required under §142.15 on state reporting.

Figure III-2 provides a checklist the Region can use to review state extensions.

Figure III-2: Extension Request Checklist

I. Reason for State Request

- ☐ Clustering of Program Revisions
- ☐ Statutory Barrier
- ☐ Regulatory Barrier
- ☐ Lack of Program Capability
 - ☐ Insufficient Resources
 - ☐ Funding Level
 - ☐ Staffing
 - ☐ Lack of Adequately Trained Staff
 - ☐ Inadequate Procedures, Guidelines, and Policies
- ☐ Other _____

II. Actions Taken by the State to Justify an Extension

- | | Schedule Dates
(or attachments) |
|--|------------------------------------|
| <input type="checkbox"/> Seeking Increases in Program Resources | _____ |
| <input type="checkbox"/> Training Existing Personnel/Revising Training Programs | _____ |
| <input type="checkbox"/> Revising State Regulations or Statutes | _____ |
| <input type="checkbox"/> Developing Revised/New Procedures, Guidelines, Policies | _____ |
| <input type="checkbox"/> Other _____ | _____ |

III. Extension Decision

- ☐ Extension Request Approved Date: ____/____/____
- ☐ Period of Extension Request: ____/____/____ to ____/____/____
- ☐ Extension Request Denied Date: ____/____/____
- ☐ Reason Cited: _____

IV. Conditions of the Extension

During the extension period the state will (check all that apply):

- ☐ Inform public water systems of the new requirements and the fact that EPA will be overseeing their implementation until the state's program is approved or submitted if state qualifies for interim primacy
- ☐ Collect and store laboratory results and other compliance data
- ☐ Provide technical assistance to public water systems
- ☐ Provide EPA with the information required under section 142.15 of the primacy rule
- ☐ Other _____

III-C. State Primacy Package

The primacy revision application package should consist of the following sections:

III-C.1 Section I—The State Primacy Revision Checklist (40 CFR 142.10)

This section is a checklist of general primacy requirements, taken from 40 CFR 142.10, as shown in Table III-2. In completing this checklist, the state must identify the program elements that it has revised in response to new federal requirements. If an element has been revised the state should indicate a "Yes" answer in the second column next to the list of program elements and should submit appropriate documentation. For elements that need not be revised, the state need only list the citation and date of adoption in the second column. During the application review process, EPA will insert findings and comments in the third column.

Table III-2: State Primacy Revision Checklist

Required Program Elements		Revision to State Program	EPA Findings/Comments
§142.10	Primary Enforcement – Definition of Public Water System*		
§142.10(a)	Regulations No Less Stringent		
§142.10(b)(1)	Maintain Inventory		
§142.10(b)(2)	Sanitary Survey Program		
§142.10(b)(3)	Laboratory Certification Program		
§142.10(b)(4)	Laboratory Capability		
§142.10(b)(5)	Plan Review Program		
§142.10(b)(6)(i)	Authority to apply regulations		
§142.10(b)(6)(ii)	Authority to sue in courts of competent jurisdiction		
§142.10(b)(6)(iii)	Right of Entry		
§142.10(b)(6)(iv)	Authority to require records		
§142.10(b)(6)(v)	Authority to require public notification		
§142.10(b)(6)(vi)	Authority to assess civil and criminal penalties		
§142.10(b)(6)(vii)	Authority to require CWSs to provide CCRs		
§142.10(c)	Maintenance of Records		
§142.10(d)	Variance/Exemption Conditions (if applicable)**		
§142.10(e)	Emergency Plans		
§142.10(f)	Administrative Penalty Authority*		

* New requirement from the 1996 Amendments. Regulations published in the April 28, 1998 *Federal Register*.

** New regulations published in the August 14, 1998 *Federal Register*.

The 1996 SDWA Amendments include new provisions for PWS definition and administrative penalty authority. States must adopt provisions at least as stringent as these new provisions, now codified at CFR 142.2 and 142.10. Failure to revise primacy for these new provisions can affect primacy for the Stage 1 DBPR. However, states may still receive primacy for the Stage 1 DBPR even if they have not yet revised their base program to comply with the new statutory requirements provided that the time to adopt these requirements (including the extension period if applicable) has not expired (April 2000 and April 2002 with extension).

Rule Bundling—States may bundle the new PWS definition, administrative penalty authority, variance and exemption requirements or any other drinking water regulation with the Stage 1 DBPR primacy revision packages so long as the submittal date (two years plus two year extension) has not lapsed. If states choose to bundle these requirements, the state needs to include the text of the state regulation/statute. The Attorney General statement should reference these new requirements.

III-C.2 Section II—Text of the State’s Regulation (40 CFR 142.11)

Each primacy application package must include the text of the state regulation.

III-C.3 Section III—Primacy Revision Crosswalk

The Primacy Revision Crosswalk, found in Appendix A, should be completed by states in order to identify state statutory or regulatory provisions that correspond to each federal requirement. If the state’s provisions differ from federal requirements, the state should explain how its requirements are “no less stringent.”

III-C.4 Section IV—State Reporting and Recordkeeping Checklists (40 CFR 142.14 and 142.15)

This section addresses state reporting and recordkeeping requirements. The state should use these checklists to explain how state reporting and recordkeeping requirements are consistent with federal requirements. If state requirements are inconsistent with federal requirements, the state must explain how its requirements are “no less stringent” as per §142.10. The checklist for the Stage 1 DBPR is presented in Table III-3.

Table III-3: Reporting and Recordkeeping Checklist for the Stage 1 DBPR

Requirement	Are state policies consistent with federal requirements? If not, please explain.
Each state that has primary enforcement responsibility must keep records of currently applicable or most recent state determinations including all supporting information and an explanation of the technical basis for each decision made under 40 CFR 141 subpart L for the control of disinfectants and disinfection byproducts; records must also include interim measures toward installation.	
Each state that has primary enforcement responsibility must keep records of systems that are installing GAC or membrane technology in accordance with §141.64(b)(2); records must include date by which the system is required to have completed installation.	

Requirement	Are state policies consistent with federal requirements? If not, please explain.
Each state that has primary enforcement responsibility must keep records of systems that are required by the state to meet alternative minimum TOC removal requirements or for whom the state has determined that the source water is not amenable to enhanced coagulation in accordance with §141.135(b)(3) and (4); records must include the alternative limits and the rationale for establishing alternative limits.	
Each state that has primary enforcement responsibility must keep records of Subpart H systems using conventional treatment meeting any of the alternative compliance criteria in §141.135(a)(2) or (3).	
Each state that has primary enforcement responsibility must keep a register of qualified operators that have met the state requirements developed under §142.16(f)(2).	
Each state that has primary enforcement responsibility must keep records of systems with multiple wells considered to be 1 treatment plant in accordance with §141.132(a)(2) and §142.16(f)(5).	
Each state that has primary enforcement responsibility must keep monitoring plans for Subpart H systems serving more than 3,300 people in accordance with §141.132(f).	
Each state that has primary enforcement responsibility must keep a list of laboratories approved for analyses in accordance with §141.131(b).	
Each state that has primary enforcement responsibility must keep a list of systems required to monitor for disinfectants and disinfection byproducts in accordance with 141 subpart L; list must indicate what disinfectants and DBPs other than chlorine, TTHM, and HAA5, if any, are measured.	

III-C.5 Section V—Special Primacy Requirements (40 CFR 142.16)

See section D. This section provides guidance on how states may choose to meet each special primacy requirement.

III-C.6 Section VI—Attorney General's Statement of Enforceability (40 CFR 142.11)

The complete and final primacy revision application must include an Attorney General statement certifying that the state regulations were duly adopted and are enforceable. The Attorney General statement should also certify that the state does not have any audit privilege or immunity laws, or if it has such laws, that these laws do not prevent the state from meeting the requirements of the Safe Drinking Water Act. If a state has submitted this certification with a previous revision package, then the state should indicate the date of submittal and the Attorney General need only certify that the status of the audit laws has not changed since the prior submittal. An example of an Attorney General statement is presented in Figure III-3.

Figure III-3: Example of Attorney General Statement

Model Language

I hereby certify, pursuant to my authority as (1) and in accordance with the Safe Drinking Water Act as amended, and (2), that in my opinion the laws of the [state / commonwealth of (3)] [or tribal ordinances of (4)] to carry out the program set forth in the "Program Description" submitted by the (5) have been duly adopted and are enforceable. The specific authorities provided are contained in statutes or regulations that are lawfully adopted at the time this Statement is approved and signed, and will be fully effective by the time the program is approved.

Guidance For States on Audit Privilege and/or Immunity Laws

In order for EPA to properly evaluate the state's request for approval, the state Attorney General or independent legal counsel should certify that the state's environmental audit immunity and/or privilege and immunity law does not affect its ability to meet enforcement and information gathering requirements under the Safe Drinking Water Act. This certification should be reasonably consistent with the wording of the state audit laws and should demonstrate how state program approval criteria are satisfied.

EPA will apply the criteria outlined in its "Statement of Principles" memo issued on 2/14/97 (See Appendix C) in determining whether states with audit laws have retained adequate enforcement authority for any authorized federal programs. The principles articulated in the guidance are based on the requirements of federal law, specifically the enforcement and compliance and state program approval provisions of environmental statutes and their corresponding regulations. The Principles provide that if provisions of state law are ambiguous, it will be important to obtain opinions from the state Attorney General or independent legal counsel interpreting the law as meeting specific federal requirements. If the law cannot be so interpreted, changes to state laws may be necessary to obtain federal program approval. Before submitting a package for approval, states with audit privilege and/or immunity laws should initiate communications with appropriate EPA Regional Offices to identify and discuss the issues raised by the state's audit privilege and/or immunity law.

Model Language

I. For States with No Audit Privilege and/or Immunity Laws

Furthermore, I certify that [state / commonwealth of (3)] has not enacted any environmental audit privilege and/or immunity laws.

II. For States with Audit Laws that do Not Apply to the State Agency Administering the Safe Drinking Water Act

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [state / commonwealth of (3)] does not affect (3) ability to meet enforcement and information gathering requirements under the Safe Drinking Water Act because the [audit privilege and/or immunity law] does not apply to the program set forth in the "Program Description." The Safe Drinking Water Act program set forth in the "Program Description" is administered by (5); the [audit privilege and/or immunity law] does not affect programs implemented by (5), thus the program set forth in the "Program Description" is unaffected by the provisions of [state / commonwealth of (3)] [audit privilege and/or immunity law].

III. For States with Audit Privilege and/or Immunity Laws that Worked with EPA to Satisfy Requirements for Federally Authorized, Delegated or Approved Environmental Programs

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [state / commonwealth of (3)] does not affect (3) ability to meet enforcement and information gathering requirements under the Safe Drinking Water Act because [state / commonwealth of (3)] has enacted statutory revisions and/or issued a clarifying Attorney General's statement to satisfy requirements for federally authorized, delegated or approved environmental programs.

Seal of Office

Signature

Name and Title

Date

- (1) State Attorney General or attorney for the primacy agency if it has independent legal counsel
- (2) 40 CFR 142.11(a)(6)(i) for initial primacy applications or 142.12(c)(1)(iii) for primacy program revision applications..
- (3) Name of state or commonwealth
- (4) Name of tribe
- (5) Name of primacy agency

III-D. Guidance for Special Primacy Requirements

This section contains guidance states can use when addressing the special primacy requirements of 40 CFR 142.16. It specifically addresses the special primacy conditions added for implementation of the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The guidance in Section III-D.1 addresses special primacy conditions in the same order that they occur in the rule. Guidance for provisions not included as special primacy requirements may be found in section III-D.2.

States should note that, in several sections, the guidance makes suggestions and offers alternatives that go beyond the minimum requirements indicated by reading the subsections of §142.16. EPA does this to provide states with information and/or suggestions that may be helpful to states' implementation efforts. Such suggestions are prefaced by "may" or "should" and are to be considered advisory. They are not required elements of states' applications for program revision.

III-D.1 Special Primacy Requirements—Stage 1 DBPR

§142.16 Special primacy requirements (h)(1): *Section 141.64(b)(2) of this chapter (interim treatment requirements). Determine any interim treatment requirements for those systems electing to install GAC or membrane filtration and granted additional time to comply with §141.64 of this chapter.*

Guidance

Under §141.64(b)(2) of the Stage 1 Disinfectants and Disinfection Byproducts Rule, a system that is installing GAC or membrane technology to comply with the MCLs for disinfection byproducts may apply to the state for an extension of up to 24 months (but not beyond December 31, 2003) for compliance with MCLs. This provision only applies to subpart H systems¹ that serve 10,000 or more people, since all other affected systems have up to 60 months to comply.

States which grant MCL extensions will need to establish an extension conditions for the requesting system. While states are only required to address how they will determine interim treatment requirements to satisfy the special primacy condition, guidance is also provided below on a range of possible extension conditions for the state's reference.

Interim measures

EPA believes that it is important for states to consider each system's potential for achieving meaningful overall risk reduction through reasonable interim treatment requirements. In their applications for program revision, states must explain how they will determine interim treatment requirements they may choose to mandate.

In making these determinations, states may wish to:

- Examine monitoring data
- Examine current treatment practices
- Examine current plant infrastructure

¹The rule defines subpart H systems as systems that use surface water or ground water under the direct influence of surface water as a source.

Some possible treatment measures that states may wish to consider (if appropriate) include the following:

- Moving the point of disinfectant application.
- Treatment changes designed for better disinfection byproduct precursor removal.
- Changing of primary and/or secondary disinfectants.
- Adjusting disinfection dose based on temperature and/or pH.
- Changing pH to reduce DBP formation.
- Implementation of a main flushing program in areas with high detention times and/or biofilm problems.

EPA strongly recommends states evaluate all potential interim treatment requirements in terms of their impact on not only disinfection byproduct formation, but also microbial protection, corrosion control, and other public health issues. Additional guidance and case studies are presented in the "Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual," USEPA, August 1999, (EPA-815-R-99-015) and is available at EPA web site: www.epa.gov/safewater/mbdp/implement.html.

Qualifying for an extension

Section 141.64(b)(2) allows a system that is installing GAC or membrane technology, to comply with the DBP MCLs, to apply to the state for an extension for compliance of up to two years. The rule sets no criteria for this extension. However, states may wish to establish criteria such as the following for systems to qualify for an extension:

- Demonstrate, through monitoring data, a need for an extension to comply with Stage 1 DBP MCLs.
- Show that the scope and/or complexity of the capital improvements warrant the length of the extension. (i.e. Extensions would be granted for only the period necessary to install the required capital improvements.

Section 141.64 (b)(2) was intended to facilitate compliance through a reduction in DBP precursors. An additional aspect of that intent was to allow utilities to move beyond the Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR) MCLs to Stage 2 targets. The Federal Advisory Committee Agreement in Principle, signed in September 2000, recommended that compliance with Stage 2 DBPR TTHM and HAA5 MCLs be determined based on a Locational Running Annual Average (LRAA) - a running annual average must be calculated at each sample location.

Extension conditions

Extension conditions for systems must require:

- Compliance schedules with milestones (including construction-based milestones). Failure to meet the schedule or interim treatment requirements is a violation of a National Primary Drinking Water Regulation.

Other extension conditions may include:

- Timely progress reports following each milestone date.
- Compliance with interim measures for public health protection as determined by the state.
- Notice of the extension in the annual Consumer Confidence Report.
- Reporting in the annual Consumer Confidence Report of the monitoring results for the contaminant for which the extension was granted.
- Adherence to Public Notice requirements if the MCL for which the extension was granted is exceeded.
- A consideration for publishing a "Notice of Availability" of a public hearing or requiring the PWS to do so.

References for more detailed guidance

1. Microbial and Disinfection Byproduct Rules Simultaneous Compliance Guidance Manual, USEPA, August 1999 (EPA 815-R-99-015).

Available from:

www.epa.gov/safewater/mdbp/implement.html; and
Safe Drinking Water Hotline: 1-800-426-4791

2. Alternative Disinfectants and Oxidants Guidance Manual, USEPA, April 1999 (EPA 815-R-99-014).

Available from:

www.epa.gov/safewater/mdbp/implement.html; and
Safe Drinking Water Hotline: 1-800-426-4791

3. Chloramination for THM Control: Principles and Practices, American Water Works Association Seminar Proceedings, 1984 Annual Conference.

Available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235
Phone: 1-800-926-7337

§142.16 Special primacy requirements. (h)(2): *Section 141.130(c) of this chapter (qualification of operators). Qualify operators of public water systems subject to 40 CFR part 141, subpart L. Qualification requirements established for operators of systems subject to 40 CFR part 141, subpart H—Filtration and Disinfection may be used in whole or in part to establish operator qualification requirements for meeting 40 CFR part 141, if the state determines that the subpart H requirements are appropriate and applicable for meeting subpart L requirements.*

Guidance

Section 141.130(c) requires that each community water system (CWS) and nontransient noncommunity water system (NTNCWS) regulated under the Stage 1 DBPR be operated by qualified personnel. Since the Stage 1 DBPR also regulates TNCWSs using chlorine dioxide, states should also consider requiring qualified operators in this system category as well.

States are given the discretion to determine the standards for operator qualifications. Under 40 CFR Part 141, Subpart H—Filtration and Disinfection, states were required to qualify operators of systems as a condition for primacy for systems covered under the SWTR. The new Stage 1 DBPR allows states to continue to use these procedures to qualify operators if the state determines that these requirements are appropriate and applicable to the set of systems covered by the Stage 1 DBPR.

The guidance for the SWTR operator personnel qualifications recommends that plant operators have a basic knowledge of science, mathematics, and chemistry involved with water treatment and supply. In this case, the state primacy application should contain a description of the SWTR procedure, how it will cover all affected PWSs, and the rationale for determining that the procedure is appropriate and applicable.

Additionally, under section 1419 of the SDWA, EPA was required to develop guidelines for the certification and re-certification of operators of community and nontransient noncommunity water systems. In consultation with states, final guidelines were developed and published in the *Federal Register* on February 5, 1999. States are required to adopt and implement an operator certification program which meets EPA's guidelines in order to avoid a withholding from their state revolving fund. Each state operation certification program must include, as a minimum, the essential elements of 9 baseline standards. These include: authorization; classification of systems, facilities, and operators; operator qualifications; enforcement; certification renewal; resources needed to implement the program; re-certification; stakeholder involvement; and program review. State operator certification programs that follow these guidelines will also be deemed to meet this special primacy requirement.

The state can also identify alternate programs they will use to qualify operators. In general, operator certification programs should consider indicators of public health risks, such as the complexity, size, and source water for treatment facilities, and the complexity and size of distribution systems when classifying and setting standards for system types and sizes.

Operators should have an understanding of the following areas:

- The principles of water treatment and distribution and their characteristics.
- The uses of potable water and variations in its demand.
- The importance of water quality to public health.
- The equipment, operation, and maintenance of the distribution system.
- The treatment process equipment used, its operational parameters, and maintenance.
- The principles of each unit.
- Performance criteria to determine operational adjustment.

- Common operating problems.
- Current regulations and monitoring requirements.
- Methods of sample collection and sample preservation.
- Laboratory equipment and tests used to analyze samples.
- Use of laboratory results to analyze plant efficiency.
- Recordkeeping.
- Customer relations.
- Budgeting and supervision.

References for more detailed guidance

1. Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources, American Water Works Association, 1990

Available from:

AWWA
6666 West Quincy Avenue
Denver, CO 80235

2. Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems, February 5, 1999 (64 FR 5915).

Available from:

<http://www.epa.gov/safewater/opcert/opcerta.htm>; and
Safe Drinking Water Hotline: 1-800-426-4791

§142.16 Special primacy requirements. (h)(3): *Section 141.131(c)(2) of this chapter (DPD colorimetric test kits). Approve DPD colorimetric test kits for free and total chlorine measurements. state approval granted under §141.74(a)(2) of this chapter for the use of DPD colorimetric test kits for free chlorine testing is acceptable for the use of DPD test kits in measuring free chlorine residuals as required in 40 CFR part 141, subpart L.*

Guidance

Section 141.131(c)(2) of the Stage 1 DBPR offers states the discretion to allow systems to use DPD colorimetric test kits for measuring residual levels for chlorine, chloramines, and chlorine dioxide. The residual measurements may then be used for compliance determinations in regard to CT requirements and maximum residual disinfectant levels (MRDLs). EPA recommends that states address the issue directly in their rules. They may wish to do this by simply adding DPD colorimetric test kits as one of the approved methods for disinfectant residual compliance monitoring or by clearly stating such kits are not approved for this purpose. When DPD test kits are approved, the state may need to establish procedures that systems must follow for making dilutions of water samples that contain chlorine concentrations that are greater than the range of the colorimetric test kit.

To meet the terms of this special primacy condition, states need only explain how the issue is addressed in their rules or other authorities, cite the relevant sections, and include copies of those rules or authority in their primacy revision applications.

142.16 Special primacy requirements. (h)(4): *Sections 141.131(c)(3) and (d) of this chapter (state approval of parties to conduct analyses). Approve parties to conduct pH, bromide, alkalinity, and residual disinfectant concentration measurements. The state's process for approving parties performing water quality measurements for systems subject to 40 CFR part 141, subpart H requirements in paragraph (b)(2)(i)(D) of this section may be used for approving parties measuring water quality parameters for systems subject to subpart L requirements, if the state determines the process is appropriate and applicable.*

Guidance

Sections 141.131(c)(3) and (d) of the Stage 1 DBPR require systems to have analyses for disinfectant residuals, pH, bromide, alkalinity, UVA and TOC conducted by parties approved by the state or EPA. The approved parties could include, but would not be limited to, EPA- or state-certified laboratories. In addition, the technical corrections (66 FR 3770) requires daily chloride samples at the entrance to the distribution system to also be measured by a party approved by EPA or the state. It is suggested that the state's process for approval of parties cover daily chloride sampling as well. To meet this special primacy requirement, states must describe how they will approve parties to conduct these measurements. The process described by the state should ensure that the measurements are reliable and accurate. To achieve this, the tests should be conducted by personnel who have adequate training and experience and who are properly equipped. Therefore, the primacy revision application should describe the criteria the state will consider, including minimum prerequisite training and laboratory facilities, when granting approvals to parties for conducting the analyses.

States may wish to limit their approvals to certain levels (or classes) of certified operators that have been provided with proper training. For some on-site measurements such as disinfectant residuals, states may determine that it is appropriate for parties to conduct the measurements if they are under the direct supervision of a certified operator.

States were required to develop processes and procedures for approving parties conducting measurements under the SWTR. As mentioned above, if states determine it to be appropriate and applicable, they may use those same processes and procedures to fulfill this special primacy requirement.

142.16 Special primacy requirements. (h)(5): *Section 141.132(a)(2) of this chapter (multiple wells as a single source). Define the criteria to use to determine if multiple wells are being drawn from a single aquifer and therefore be considered a single source for compliance with monitoring requirements.*

Guidance

Section 142.132(a)(2) of the Stage 1 DBPR gives states the discretion to allow PWSs to reduce TTHM and HAA5 monitoring and associated costs by considering multiple wells drawing water from the same aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required. This provision is applicable when there are multiple treatment plants applying the same disinfectant to multiple wells completed in the same aquifer. To qualify for the ability to make this discretionary reduction, states must establish criteria under this special primacy requirement. The criteria adopted by states should be designed to ensure that each well is indeed drawing from the identified aquifer. In addition, the finished water quality characteristics of all wells should be very similar. Thus, the water from the wells should be expected to react alike in terms of formation of disinfection byproducts.

In general, EPA recommends that states require PWSs that are seeking a reduction in monitoring under §141.132(a)(2) to submit an evaluation or study performed by a professional competent in the field of hydrogeology such as a geologist, hydrogeologist, or professional engineer.² The evaluation required by the state should, with reasonable certainty, show all wells are completed in, and drawing water from, the same aquifer and that the water quality characteristics/chemistry of each well are enough alike to conclude disinfection byproduct formation would be very similar.

Some of the criteria states may consider for making these determinations include the following:

Well construction and geology

- Well locations—the locations of all wells should be marked on topographic maps.
- Well depths.
- Well logs—the logs should show the geological strata encountered during well construction, identify water producing zones, screened or slotted sections, and grouting.
- Static water levels based upon a common elevation point.
- Aquifer studies and maps.
- Treatment applied.

Water characteristics and chemistry

- pH (field).
- Temperature (field).
- Specific conductivity.

² Often relevant information can be obtained from the USGS, state geological surveys, or state bureaus of mines and geology.

- Total organic carbon (TOC).
- Analyses of common ions with a calculated cation/anion balance (calcium, magnesium, iron, manganese, sodium, sulfate, alkalinity, chloride).

In many cases there may be reports, maps, or studies available from state or federal agencies that will be helpful in making the determinations.

142.16 Special primacy requirements. (h)(6): *Approve alternate minimum TOC removal (Step 2) requirements, as allowed under the provisions of 141.135(b) of this chapter.*

Guidance

Subpart H systems that use conventional filtration treatment are required to operate with enhanced coagulation or enhanced softening to achieve mandatory levels of total organic carbon (TOC) removal unless the system meets one or more of the "alternative compliance criteria" listed in §141.135(a)(2) or (a)(3) of the Stage 1 DBPR. This requirement of §141.135 is designed to provide a level of protection for unknown and/or unregulated disinfection byproducts.

Systems which cannot achieve the Step 1 minimum TOC removal requirements as presented in the table found in §141.135(b)(2) due to water quality parameters or operational constraints must apply to the state for approval of alternative minimum TOC removal (Step 2) requirements. The applications systems make to the state for approval of Step 2 minimum TOC removal requirements must include, as a minimum, results of bench- or pilot-scale testing conducted pursuant to §141.135(b)(4)(i) of the Stage 1 DBPR. Guidance for systems conducting this testing and for states in determining how and under what conditions to approve Step 2 TOC removal requirements, is found in the Guidance Manual for Enhanced Coagulation and Enhanced Softening, USEPA, 1999.

In states' applications for primacy revision, adequate information must be provided to ensure that approvals for alternative minimum TOC removals (Step 2) will meet the requirements of 141.135(b). The state should describe the process they will use to determine appropriate Step 2 removal requirements.

References for more detailed guidance

1. Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual, USEPA, May 1999 (EPA 815-R-99-012).

Available from:

www.epa.gov/safewater/mdbp/implement.html; and
Safe Drinking Water Hotline: 1-800-426-4791

III-D.2 Other Requirements in the Stage 1 DBPR

§141.132 (f) Monitoring plans: *Each system required to monitor under this subpart must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the state and the general public no later than 30 days following the applicable compliance dates in §141.130(b). All Subpart H systems serving more than 3300 people must submit a copy of the monitoring plan to the state no later than the date of the first report required under §141.134³. The state may also require the plan to be submitted by any other system. After review, the state may require changes in any plan elements. The plan must include the following elements:*

1. *Specific locations and schedules for collecting samples for any parameters included in this subpart.*
2. *How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.*
3. *If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of §141.29, the sampling plan must reflect the entire distribution system.*

Guidance

Section 141.132(f) requires each system to develop and implement a monitoring plan for monitoring that must be performed pursuant to subpart L. Systems must make the plan available for review by the state and public no later than 30 days following the applicable compliance dates (see §141.130(b)). Surface water systems (including GWUDI) serving more than 3,300 people must submit a copy of their monitoring plan with their first monitoring report required under subpart L. States may require other systems to submit copies as well.

The monitoring requirements of the Stage 1 DBPR can be complex; therefore, monitoring plans should be helpful to systems in terms of ensuring compliance. Although there is no special primacy condition related to monitoring plans, EPA believes that limited guidance may be helpful to states.

EPA suggests that states consider developing a procedure for PWSs to follow when preparing the required monitoring plans. The procedure should ensure that systems prepare all plans in a format that is useful to both the systems and the state. Some items states may wish to consider as suggestions (or requirements) for systems to include in their monitoring plans are the following:

- A cover page that identifies the public water system and includes relevant information such as—
 - System name
 - PWSID Number
 - Address
 - Contact person and phone number
 - System type (community, nontransient noncommunity, transient noncommunity)
 - Population served
 - Source water information (number and type)
 - Entry points (tied to source(s))
 - Treatment provided (tied to sources and entry points)
- A summary of the subpart L monitoring that will be required of the system, including monitoring for—
 - Disinfection byproducts

³ §141.134 of the Stage 1 DBPR addresses the reporting and recordkeeping requirements of public water systems. In general, reports are required to be submitted to the state within 10 days after the end of the monitoring period.

- Disinfectants
- Disinfection byproduct precursors
- Schematic drawings of all treatment facilities, including—
 - Source(s)
 - Identification of treatment type and purpose
 - Identification of chemicals applied and points of application
 - Each unit process of each treatment train (with flow rates)
 - Sampling points identified and numbered (e.g. T-1, T-2)
- A schematic drawing of the distribution system (and consecutive systems), including—
 - Sources
 - Entry points
 - Treatment facilities
 - Storage facilities
 - Sampling points identified and numbered (e.g. D-1, D-2)
- A summary of typical system operating characteristics (on a seasonal basis if necessary) explaining how sources are used to meet system demands, where extended residence times⁴ are expected to occur, etc.
- A schedule for collecting all required samples including frequency and times for collection, sample site identification number, sample handling/preservation requirements, and analysis plan for each sample (on site analysis, certified laboratory). The schedule should address both regular monitoring and reduced monitoring frequencies (if allowed by the state).
- The plan should also distinguish between compliance samples and those taken for process control and/or information.
- For conventional treatment plants for Subpart H systems, a summary of the system's enhanced coagulation/softening requirements.
- A plan for calculating compliance with MCLs, MRDLs, and treatment techniques (unless compliance is calculated by the state based upon required monitoring reports).

Some states may wish to expand the subpart L monitoring requirements to include other monitoring requirements. A single monitoring plan, addressing all of a system's monitoring requirements, may be a useful tool for both the state and the PWS.

References for more detailed guidance

1. ICR Sampling Manual, USEPA, April 1996 (PB96-157508).

Available from:

NTIS
5285 Port Royal Rd
Springfield, VA 22161
Phone: 1-800-553-6847

2. ICR Water Utility Database System Users' Guide, USEPA, April 1996 (PB96-157219).

Available from:

NTIS
5285 Port Royal Rd
Springfield, VA 22161
Phone: 1-800-553-6847

⁴ In some cases states may wish to require modeling to establish locations of high residence time.

Section IV.

Other Resources and Guidance

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IV-A. Technical Information Available on the Stage 1 DBPR

A series of guidance manuals support the Stage 1 DBPR. The manuals will aid EPA, state agencies, and affected PWSs in implementing this rule and will help ensure that implementation among these groups is consistent. Summaries of the manuals and information on how to obtain them are provided below. The three technical guidance manuals associated with the Stage 1 DBPR are:

- ✓ Alternative Disinfectants and Oxidants Guidance Manual
- ✓ M-DBP Simultaneous Compliance Guidance Manual
- ✓ Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual

Alternative Disinfectants and Oxidants Guidance Manual (EPA 815-R-99-014)

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant, or disinfectants, is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment, and operator skill). The manual also contains a summary of existing alternative disinfectants used in the U.S. and cost estimates for the use of alternative disinfectants.

M-DBP Simultaneous Compliance Guidance Manual (EPA 815-R-99-015)

Objective: To assist PWSs on complying simultaneously with various drinking water regulations (e.g., Stage 1 DBPR, IESWTR, Lead and Copper Rule, and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rule.

Contents: The manual provides detailed information on the requirements in the Stage 1 DBPR and the IESWTR.

Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual (EPA 815-R-99-012)

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 DBPR and to provide guidance to state staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement, explains how to set an alternative TOC removal percentage under the Step 2 procedure, details monitoring, reporting, and compliance requirements, and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Links to these manuals can be found at the website:
www.epa.gov/safewater/mdbp/implement.html.

They are also available free of charge (while supplies last) from:

- ☛ The National Service for Environmental Publications (NSCEP, formerly NCEPI) at 1.800.490.9198
- ☛ The Office of Water Resource Center at 1.202.260.7786.

IV-B. Rule Presentation

A presentation that can be used for workshops for the Stage 1 DBPR is available in Power Point format on the Drinking Water Academy web site.

(<http://www.epa.gov/safewater/dwa/electronic/M-DBPmodule.html>)

IV-C. Fact Sheets

The following pages are fact sheets on the rules. They may be useful in conveying information to water systems, new personnel, and for educating stakeholders about the rules. The fact sheets are included in this section are:

- ✓ Drinking Water Priority Rulemaking: Microbial and Disinfection Byproduct Rules
- ✓ Stage 1 Disinfectants and Disinfection Byproducts Rule
- ✓ Stage 1 Disinfectants and Disinfection Byproducts Rule: Quick Reference Guide



Drinking Water Priority Rulemaking: Microbial and Disinfection Byproduct Rules

Disinfection of drinking water is one of the major public health advances in the 20th century. One hundred years ago, typhoid and cholera epidemics were common throughout American cities and disinfection was a major factor in reducing these epidemics. However, the disinfectants themselves can react with naturally-occurring materials in the water to form unintended byproducts which may pose health risks.

Over the past ten years, we have also learned that there are specific microbial pathogens, such as *Cryptosporidium*, that are highly resistant to traditional disinfection practices. In 1993, *Cryptosporidium* caused 400,000 people in Milwaukee to experience intestinal illness. More than 4,000 were hospitalized, and at least 50 deaths have been attributed to the disease. There have also been cryptosporidiosis outbreaks in Nevada, Oregon, and Georgia over the past several years.

A major challenge for water suppliers is how to balance the risks from microbial pathogens and disinfection byproducts. It is important to provide protection from these microbial pathogens while simultaneously ensuring decreasing health risks to the population from disinfection byproducts (DBPs). The Safe Drinking Water Act (SDWA) Amendments, signed by President Clinton in August 1996, required EPA to develop rules to achieve these goals.

These new rules are a product of six years of collaboration between the water industry, environmental and public health groups, and local, state and federal government. This fact sheet contains general information about the two new rules and others that are a part of the Microbial-Disinfectants and Disinfection Byproducts (M-DBP) Rules. Separate fact sheets focus on the Interim Enhanced Surface Water Treatment Rule (EPA 816-F-01-013) and the Stage 1 Disinfectants and Disinfection Byproducts Rule (EPA 816-F-01-014).

Schedule of M-DBP Rules

December 16, 1998 – Final Rule	Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule
June 8, 2001 – Final Rule	Filter Backwash Recycling Rule
Summer 2001 – Final Rule	Long Term 1 Enhanced Surface Water Treatment Rule
Spring/Summer 2002 – Final Rule	Ground Water Rule
May 2002 – Final Rule	Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproducts Rule

PUBLIC HEALTH CONCERNS

Most Americans drink tap water that meets all existing health standards all the time. These new rules will further strengthen existing drinking water standards and thus increase protection for many water systems.

In 1990, EPA's Science Advisory Board concluded that exposure to microbial contaminants such as bacteria, viruses, and protozoa (e.g., *Giardia lamblia* and *Cryptosporidium*) was likely the greatest remaining health risk management challenge for drinking water suppliers. Acute health effects from exposure to microbial pathogens is documented and associated illness can range from mild to moderate cases lasting only a few days to more severe infections that can last several weeks and may result in death for those with weakened immune systems.

While disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and the distribution system to form potentially harmful DBPs. Many of these DBPs have been shown to cause cancer and reproductive and developmental effects in laboratory animals. More than 200 million people consume water that has been disinfected. Because of the large population exposed, health risks associated with DBPs, even if small, need to be taken seriously.

EXISTING REGULATIONS

- Surface Water Treatment Rule – The Surface Water Treatment Rule, promulgated in 1989, applies to all public water systems using surface water sources or ground water sources under the direct influence of surface water. It establishes maximum contaminant level goals (MCLGs) for viruses, bacteria and *Giardia lamblia*. It also includes treatment technique requirements for filtered and unfiltered systems that are specifically designed to protect against the adverse health effects of exposure to these microbial pathogens.
- Total Coliform Rule – The Total Coliform Rule, revised in 1989, applies to all PWSs and establishes a maximum contaminant level (MCL) for total coliforms.
- Total Trihalomethane Rule – In 1979, EPA set an interim MCL for total trihalomethanes of 0.10 mg/l as an annual average. This applies to any community water system serving at least 10,000 people that adds a disinfectant to the drinking water during any part of the treatment process.
- Information Collection Rule – The Information Collection Rule, promulgated in 1996, established monitoring and data reporting requirements for large public water systems serving at least 100,000 people to support the M-DBP rulemaking process. This rule was intended to provide EPA with information on the occurrence in drinking water of microbial pathogens and DBPs. In addition, EPA collected engineering data on how PWSs currently control such contaminants.

INTERIM ENHANCED SURFACE WATER TREATMENT RULE AND STAGE 1 DISINFECTANTS AND DISINFECTION BYPRODUCTS RULE

EPA published the Interim Enhanced Surface Water Treatment Rule and Stage 1 Disinfectants and Disinfection Byproducts Rule in December 1998. The final rules resulted from formal regulatory negotiations with a wide range of stakeholders that took place in 1992-93 and 1997.

Interim Enhanced Surface Water Treatment Rule

The Interim Enhanced Surface Water Treatment Rule applies to systems using surface water, or ground water under the direct influence of surface water, that serve 10,000 or more persons. The rule also includes provisions for states to conduct sanitary surveys for surface water systems regardless of system size. The rule builds upon the treatment technique requirements of the Surface Water Treatment Rule with the following key additions and modifications:

- Maximum contaminant level goal (MCLG) of zero for *Cryptosporidium*.
- 2-log *Cryptosporidium* removal requirements for systems that filter.
- Strengthened combined filter effluent turbidity performance standards.
- Individual filter turbidity monitoring provisions.
- Disinfection profiling and benchmarking provisions.
- Systems using ground water under the direct influence of surface water now subject to the new rules dealing with *Cryptosporidium*.
- Inclusion of *Cryptosporidium* in the watershed control requirements for unfiltered public water systems.
- Requirements for covers on new finished water storage facilities.
- Sanitary surveys, conducted by states, for all surface water systems regardless of size.

The Interim Enhanced Surface Water Treatment Rule, with tightened turbidity performance criteria and required individual filter monitoring, is designed to optimize treatment reliability and to enhance physical removal efficiencies to minimize the *Cryptosporidium* levels in finished water. In addition, the rule includes disinfection benchmark provisions to assure continued levels of microbial protection while facilities take the necessary steps to comply with new DBP standards.

Stage 1 Disinfectants and Disinfection Byproducts Rule

The final Stage 1 Disinfectants and Disinfection Byproducts Rule applies to community water systems and non-transient non-community systems and transient non-community water systems using chlorine dioxide MCLs, including those serving fewer than 10,000 people, that add a disinfectant to the drinking water during any part of the treatment process.

The final Stage 1 Disinfectants and Disinfection Byproducts Rule includes the following key provisions:

- Maximum residual disinfectant level goals (MRDLGs) for chlorine (4 mg/L), chloramines (4 mg/L), and chlorine dioxide (0.8 mg/L).
- Maximum contaminant level goals (MCLGs) for three trihalomethanes (bromodichloromethane (zero), dibromochloromethane (0.06 mg/L), and bromoform (zero)), two haloacetic acids (dichloroacetic acid (zero) and trichloroacetic acid (0.3 mg/L)), bromate (zero), and chlorite (0.8 mg/L).
- MRDLs for three disinfectants (chlorine (4.0 mg/L), chloramines (4.0 mg/L), and chlorine dioxide (0.8 mg/L)).
- MCLs for total trihalomethanes (0.080 mg/L) - a sum of the three listed above plus chloroform, haloacetic acids (HAA5) (0.060 mg/L) - a sum of the two listed above plus monochloroacetic acid and

mono- and dibromoacetic acids), and two inorganic disinfection byproducts (chlorite (1.0 mg/L)) and bromate (0.010 mg/L)).

- A treatment technique for removal of DBP precursor material.

The terms MRDLG and MRDL, which are not included in the SDWA, were created during the negotiations to distinguish disinfectants (because of their beneficial use) from contaminants. The final rule includes monitoring, reporting, and public notification requirements for these compounds. This final rule also describes the best available technology (BAT) upon which the MRDLs and MCLs are based.

FUTURE RULES

Long Term 1 Enhanced Surface Water Treatment Rule

While the Stage 1 Disinfectants and Disinfection Byproducts Rule will apply to systems of all sizes, the Interim Enhanced Surface Water Treatment Rule only applies to systems serving 10,000 or more people. The Long Term 1 Enhanced Surface Water Treatment Rule, expected in 2001, will strengthen microbial controls for small systems (i.e. those systems serving fewer than 10,000 people). The rule will also prevent significant increase in microbial risk where small systems take steps to implement the Stage 1 Disinfectants and Disinfection Byproducts Rule.

EPA believes that the rule will generally track the approaches in the Interim Enhanced Surface Water Treatment Rule for improved turbidity control, including individual filter monitoring and reporting. The rule will also address disinfection profiling and benchmarking.

Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproduct Rule

The SDWA, as amended in 1996, requires EPA to finalize a Stage 2 Disinfectants and Disinfection Byproducts Rule by May 2002. Although the 1996 Amendments do not require EPA to finalize a Long Term 2 Enhanced Surface Water Treatment Rule along with the Stage 2 Disinfectants and Disinfection Byproducts Rule, EPA believes it is important to finalize these rules together to ensure a proper balance between microbial and DBP risks.

EPA began discussions with stakeholders in December 1998 on the direction for these rules. EPA anticipates proposed rules in 2001. The intent of the rules is to provide additional public health protection, if needed, from DBPs and microbial pathogens.

Ground Water Rule

EPA is finalizing the Ground Water Rule which specifies the appropriate use of disinfection and, just as importantly, addresses other components of ground water systems to ensure public health protection. There are more than 158,000 public ground water systems. Almost 89 million people are served by community ground water systems, and 20 million people are served by non-community ground water systems. Ninety-nine percent (157,000) of ground water systems serve fewer than 10,000 people. However, systems serving more than 10,000 people serve 55 percent (more than 60 million) of all people who get their drinking water from public ground water systems.

Filter Backwash Recycling Rule

The Filter Backwash Recycling Rule establishes a standard to return all recycle flows to a point that incorporates all treatment processes of the system's existing conventional or direct filtration systems or at an alternate location approved by the state. The regulation will apply to public water systems that use surface water or ground water under the direct influence of surface water, practice conventional or direct filtration,

and recycle spent filter backwash, sludge thickener supernatant, or liquids from dewatering processes. The rule was promulgated on June 8, 2001.

ADDITIONAL INFORMATION

EPA encourages public input into regulation development. Public meetings and opportunities for public comment on M-DBP rules are announced in the *Federal Register*. EPA's Office of Ground Water and Drinking Water also provides this information for the M-DBP rules and other programs in its online Calendar of Events.

For more information, contact EPA's Safe Drinking Water Hotline, 1-800- 426-4791, or see the Office of Ground Water and Drinking Water web page at <http://www.epa.gov/safewater/standards.html>.

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Stage 1 Disinfectants and Disinfection Byproducts Rule

In the past 25 years, the Safe Drinking Water Act (SDWA) has been highly effective in protecting public health and has also evolved to respond to new and emerging threats to safe drinking water. Disinfection of drinking water is one of the major public health advances in the 20th century. One hundred years ago, typhoid and cholera epidemics were common through American cities; disinfection was a major factor in reducing these epidemics.

However, the disinfectants themselves can react with naturally-occurring materials in the water to form unintended byproducts which may pose health risks. In addition, in the past 10 years, we have learned that there are specific microbial pathogens, such as *Cryptosporidium*, which can cause illness, and is highly resistant to traditional disinfection practices.

Amendments to the SDWA in 1996 require EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts (DBPs). It is important to strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of DBPs. The Stage 1 Disinfectants and Disinfection Byproducts Rule and Interim Enhanced Surface Water Treatment Rule, announced in December 1998, are among the first of a set of rules under the 1996 SDWA Amendments. This fact sheet focuses on the Stage 1 Disinfectants and Disinfection Byproducts Rule. A separate fact sheet focuses on the Interim Enhanced Surface Water Treatment Rule (EPA 816-F-01-013).

PUBLIC HEALTH CONCERNS

While disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form DBPs. Results from toxicology studies have shown several DBPs (e.g., bromodichloromethane, bromoform, chloroform, dichloroacetic acid, and bromate) to be carcinogenic in laboratory animals. Other DBPs (e.g., chlorite, bromodichloromethane, and certain haloacetic acids) have also been shown to cause adverse reproductive or developmental effects in laboratory animals. Several epidemiology studies have suggested a weak association between certain cancers (e.g., bladder) or reproductive and developmental effects, and exposure to chlorinated surface water. More than 200 million people consume water that has been disinfected. Because of the large population exposed, health risks associated with DBPs, even if small, need to be taken seriously.

WHO MUST COMPLY WITH THE RULE?

The Stage 1 Disinfectants and Disinfection Byproducts Rule applies to all community and nontransient noncommunity water systems that add a chemical disinfectant in any part of the drinking water treatment process and transient NCWSs using chlorine dioxide.

WHAT DOES THE RULE REQUIRE?

The Stage 1 Disinfectants and Disinfection Byproduct Rule updates and supersedes the 1979 regulations for total trihalomethanes. In addition, it will reduce exposure to three disinfectants and many disinfection byproducts.

The rule establishes maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs) for three chemical disinfectants—chlorine, chloramine and chlorine dioxide (see Table 1). It also establishes maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for total trihalomethanes, haloacetic acids, chlorite and bromate (see Table 1).

Table 1
MRDLGs, MRDLs, MCLGs and MCLs for Stage 1 Disinfectants
and Disinfection Byproducts Rule

Disinfectant Residual	MRDLG (mg/L)	MRDL (mg/L)	Compliance Based On
Chlorine	4 (as Cl ₂)	4.0 (as Cl ₂)	Annual Average
Chloramine	4 (as Cl ₂)	4.0 (as Cl ₂)	Annual Average
Chlorine Dioxide	0.8 (as ClO ₂)	0.8 (as ClO ₂)	Daily Samples
Disinfection Byproducts	MCLG (mg/L)	MCL (mg/L)	Compliance Based On
Total trihalomethanes (TTHM) ¹	N/A	0.080	Annual Average
- Chloroform	N/A		
- Bromodichloromethane	zero		
- Dibromochloromethane	0.06		
- Bromoform	zero		
Haloacetic acids (five) (HAA5) ²	N/A	0.060	Annual Average
- Dichloroacetic acid	zero		
- Trichloroacetic acid	0.3		
Chlorite	0.8	1.0	Monthly Average
Bromate	zero	0.010	Annual Average

N/A Not applicable because there are individual MCLGs for TTHMs or HAAs.

1 Total trihalomethanes is the sum of the concentrations of chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

2 Haloacetic acids (five) is the sum of the concentrations of mono-, di-, and trichloroacetic acids and mono- and dibromoacetic acids.

Water systems that use surface water or ground water under the direct influence of surface water and use conventional filtration treatment are required to remove specified percentages of organic materials, measured as total organic carbon (TOC), that may react with disinfectants to form DBPs (See Table 2). Removal will be achieved through a treatment technique (enhanced coagulation or enhanced softening) unless a system meets alternative criteria.

Table 2
Required Removal of Total Organic Carbon by Enhanced Coagulation and Enhanced Softening for
Subpart H Systems Using Conventional Treatment¹

Source Water TOC (mg/L)	Source Water Alkalinity (mg/L as CaCO ₃)		
	0-60	>60-120	>120 ²
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

1-Systems meeting at least one of the alternative compliance criteria in the rule are not required to meet the removals in this table.

2-Systems practicing softening must meet the TOC removal requirements in the last column to the right.

WHAT ARE THE COMPLIANCE DEADLINES?

Surface water systems and systems using ground water under the direct influence of surface water serving 10,000 or more people are required to comply with the Stage 1 Disinfectants and Disinfection Byproducts Rule by January 1, 2002. All ground water systems and systems using surface water or ground water under the direct influence of surface water serving less than 10,000 people must comply with the Stage 1 Disinfectants and Disinfection Byproducts Rule by January 1, 2004.

WHAT ARE THE COSTS AND BENEFITS OF THE RULE?

EPA estimates that implementation of the Stage 1 Disinfectants and Disinfection Byproducts Rule will result in:

- 1- As many as 140 million people receiving increased protection from DBPs.
- 2- 24 percent national average reduction in TTHM levels.
- 3- Reduction in exposure to the major DBPs from use of ozone (bromate) and chlorine dioxide (chlorite).

The total annual cost of the rule is about \$700 million. EPA believes that the benefits exceed the costs of the Stage 1 Disinfectants and Disinfection Byproducts Rule. An estimated 115 million households are affected by the Stage 1 Disinfectants and Disinfection Byproducts Rule. EPA estimates that 95 percent of the households will incur additional costs of less than \$1 per month on their water bills. An additional four percent will pay between \$1 and \$10 per month more, and one percent are expected to incur increased water bills of \$10 to \$33 per month, if they choose to install treatment. However, many of these systems may chose less costly non-treatment options, such as consolidation. The majority of households incurring the highest costs are small systems serving less than 10,000 people that have never been regulated for DBPs.

WHAT TECHNICAL INFORMATION WILL BE AVAILABLE ON THE RULE?

A series of guidance manuals have been developed to support the Stage 1 Disinfectants and Disinfection Byproducts Rule. The manuals will aid EPA, state agencies and affected public water systems in implementing the Stage 1 DBPR. The guidance manual are available on EPA's website at www.epa.gov/safewater/mdbp/implement.html.

Guidance Manual for Enhanced Coagulation and Enhanced Precipitative Softening

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 Disinfectants and Disinfection Byproducts Rule and to provide guidance to state staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement; explains how to set an alternative TOC removal percentage under the Step 2 procedure; details monitoring, reporting, and compliance requirements; and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Alternative Disinfectants and Oxidants Guidance Manual

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine, so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant(s) is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment and operator skill). The manual also contains a summary of existing alternative disinfectants use in the United States and cost estimates for the use of alternative disinfectants.

M/DBP Simultaneous Compliance Manual

Objective: To assist public water systems on complying simultaneously with various drinking water regulations (e.g., Stage 1 Disinfectants and Disinfection Byproducts Rule, Interim Enhanced Surface Water Treatment Rule, Lead and Copper Rule and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rules.

Contents: The manual provides detailed information on the requirements in the Stage 1 Disinfectants and Disinfection Byproducts Rule and the Interim Enhanced Surface Water Treatment Rule and issues involved with simultaneously complying with other rules.

For more information, contact EPA's Safe Drinking Water Hotline, 1.800.426.4791, or see the Office of Ground Water and Drinking Water web page at <http://www.epa.gov/safewater/standards.html>.



Stage 1 Disinfectants and Disinfection Byproducts Rule: A Quick Reference Guide

Overview of the Rule

Title	Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) 63 FR 69390 - 69476, December 16, 1998, Vol. 63, No. 241
	Revisions to the Interim Enhanced Surface Water Treatment Rule (IESWTR), the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR), and Revisions to State Primacy Requirements to Implement the Safe Drinking Water Act (SDWA) Amendments 66 FR 3770, January 16, 2001, Vol 66, No. 29
Purpose	Improve public health protection by reducing exposure to disinfection byproducts. Some disinfectants and disinfection byproducts (DBPs) have been shown to cause cancer and reproductive effects in lab animals and suggested bladder cancer and reproductive effects in humans.
General Description	The Stage 1 DBPR is the first of a staged set of rules that will reduce the allowable levels of DBPs in drinking water. The new rule establishes seven new standards and a treatment technique of enhanced coagulation or enhanced softening to further reduce DBP exposure. The rule is designed to limit capital investments and avoid major shifts in disinfection technologies until additional information is available on the occurrence and health effects of DBPs.
Utilities Covered	The Stage 1 DBPR applies to all sizes of community water systems and nontransient noncommunity water systems that add a disinfectant to the drinking water during any part of the treatment process and transient noncommunity water systems that use chlorine dioxide.

Public Health Benefits

Implementation of the Stage 1 DBPR will result in ...	<ul style="list-style-type: none">▶ As many as 140 million people receiving increased protection from DBPs.▶ 24 percent average reduction nationally in trihalomethane levels.▶ Reduction in exposure to the major DBPs from use of ozone (DBP = bromate) and chlorine dioxide (DBP = chlorite).
Estimated impacts of the Stage 1 DBPR include ...	<ul style="list-style-type: none">▶ National capital costs: \$2.3 billion▶ National total annualized costs to utilities: \$684 million▶ 95 percent of households will incur an increase of less than \$1 per month.▶ 4 percent of households will incur an increase of \$1-10 per month.▶ <1 percent of households will incur an increase of \$10-33 per month.

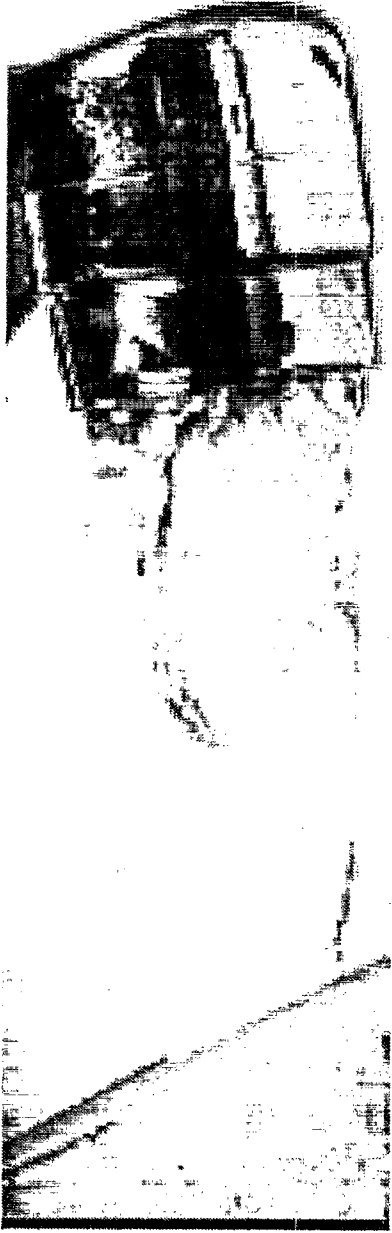
Critical Deadlines and Requirements

For Drinking Water Systems

January 1, 2002	Surface water systems and ground water systems under the direct influence of surface water serving $\geq 10,000$ people must comply with the Stage 1 DBPR requirements.
January 1, 2004	Surface water systems and ground water systems under the direct influence of surface water serving $< 10,000$, and all ground water systems must comply with the Stage 1 DBPR requirements.

For States

December 16, 2000	States submit Stage 1 DBPR primacy revision applications to EPA (triggers interim primacy).
December 16, 2002	Primacy extension deadline - all states with an extension must submit primacy revision applications to EPA.



Regulated Contaminants/Disinfectants					
Regulated Contaminants	MCL (mg/L)	MCLG (mg/L)	Regulated Disinfectants	MRDL* (mg/L)	MRDLG* (mg/L)
Total Trihalomethanes (TTHM)	0.080		Chlorine	4.0 as Cl ₂	4
Chloroform		-			
Bromodichloromethane		zero			
Dibromochloromethane		0.06			
Bromoform		zero			
Five Haloacetic Acids (HAA5)	0.060		Chloramines	4.0 as Cl ₂	4
Monochloroacetic acid		-	Chlorine dioxide	0.8	0.8
Dichloroacetic acid		zero			
Trichloroacetic acid		0.3			
Bromoacetic acid		-			
Dibromoacetic acid		-			
Bromate (plants that use ozone)	0.010	zero	*Stage 1 DBPR includes maximum residual disinfectant levels (MRDLs) and maximum residual disinfectant level goals (MRDLGs) which are similar to MCLs and MCLGs, but for disinfectants.		
Chlorite (plants that use chlorine dioxide)	1.0	0.8			
Treatment Technique					
Enhanced coagulation/enhanced softening to improve removal of DBP precursors (See Step 1 TOC Table) for systems using conventional filtration treatment.					

Step 1 TOC Table - Required % Removal of TOC			
Source Water TOC (mg/L)	Source Water Alkalinity, mg/L as CaCO ₃		
	0-60	> 60-120	> 120
> 2.0 to 4.0	35.0%	25.0%	15.0%
> 4.0 to 8.0	45.0%	35.0%	25.0%
> 8.0	50.0%	40.0%	30.0%

¹Systems meeting at least one of the alternative compliance criteria in the rule are not required to meet the removals in this table.

²Systems practicing softening must meet the TOC removal requirements in the last column to the right

Routine Monitoring Requirements			
	Coverage	Monitoring Frequency	Compliance
TTHM/HAA5	Surface and ground water under the direct influence of surface water serving ≥ 10,000	4/plant/quarter	Running annual average
	Surface and ground water under the direct influence of surface water serving 500 - 9,999	1/plant/quarter	Running annual average
	Surface and ground water under the direct influence of surface water serving < 500	1/plant/year in month of warmest water temperature**	Running annual average of increased monitoring
	Ground water serving ≥ 10,000	1/plant/quarter	Running annual average
	Ground water serving < 10,000	1/plant/year in month of warmest water temperature**	Running annual average of increased monitoring
Bromate	Ozone plants	Monthly	Running annual average
Chlorite	Chlorine dioxide plants	Daily at entrance to distribution system; monthly in distribution system	Daily/follow-up monitoring
Chlorine dioxide	Chlorine dioxide plants	Daily at entrance to distribution system	Daily/follow-up monitoring
Chlorine/Chloramines	All systems	Same location and frequency as TCR sampling	Running annual average
DBP precursors	Conventional filtration	Monthly for total organic carbon and alkalinity	Running annual average

** System must increase monitoring to 1 sample per plant per quarter if an MCL is exceeded.

For additional information on the Stage 1 DBPR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA web site at www.epa.gov/safewater; or contact your State drinking water representative.

Additional material is available at www.epa.gov/safewater/mbdp/Implement.html.

IV-D. Frequently Asked Questions

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1.0 Stage 1 Disinfectants/Disinfection Byproducts Rule

1.1 Disinfectants

1.1.1 Chlorine and Chloramines

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(76), (77)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.54	Maximum Residual Disinfectant Level Goals
§141.65	Maximum Residual Disinfectant Levels
§141.131(c)(1), (2), (3)	Analytical Requirements
§141.132(c)(1)(i), (ii), (iii)	Monitoring Requirements
§141.133(c)(1)(i), (ii)	Compliance Requirements
§141.134(c)	Reporting and Recordkeeping Requirements

Q: *Under the Surface Water Treatment Rule water systems can measure heterotrophic plate counts (HPC) in lieu of chlorine residuals. If the results of the HPC are acceptable (< 500 cfu/ml) they are determined to be in compliance with the requirement for a detectable residual in the distribution system. Will these systems now be required to measure a chlorine residual to ensure they do not exceed the MRDL?*

A: Yes. The Stage 1 DBPR requires that disinfection residuals be measured to ensure the MRDL is not exceeded. Therefore, HPC measurements cannot be performed in lieu of this testing. However, where detectable residuals are not found, HPCs may be conducted for SWTR compliance.

Q: *Our state requires daily chlorine residual measurements to be taken throughout the distribution system. What samples should be considered when calculating compliance with the MRDL?*

A: For the Stage 1 DBPR's MRDL, compliance is based upon the samples collected under §141.132(c)(1). The samples are collected at the same time and place as coliform samples as specified in §141.21. Subpart H systems may use samples collected under the requirements of the SWTR (§141.74(c)(3)(i)) in lieu of taking separate samples. The system's monitoring plan will indicate which samples are to be used for compliance determinations.

Q: *Can systems use additional chlorine sampling sites (if states have approved additional sites beyond the TCR)?*

A: Yes, if these are included in the monitoring plan.

Q: *Does the Stage 1 DBPR apply to chlorine added to the treatment process as an oxidant?*

A: Yes. The requirements are applicable to chlorine added anywhere in the treatment process due to the potential formation of TTHM and HAA5.

- Q:** *For a system to comply with the MRDLs for chlorine and chloramine, what residual disinfectant concentration should be measured?*
- A:** For a system that uses free chlorine for residual maintenance, either free or total chlorine measurement is acceptable. For a system that uses chloramines for residual maintenance, the measure must be combined or total chlorine.

1.1.2 Chlorine Dioxide

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(78)(i), (ii)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.54	Maximum Residual Disinfectant Level Goals
§141.65	Maximum Residual Disinfectant Levels
§141.131(e)(1), (2), (3)	Analytical Requirements
§141.132(c)(2)(i), (ii), (iii)	Monitoring Requirements
§141.133(c)(2)(i), (ii)	Compliance Requirements
§141.134(c)	Reporting and Recordkeeping Requirements

- Q:** *Does daily monitoring for chlorine dioxide mean 7 days a week? Some systems are not staffed on the weekend. Do systems that add chlorine dioxide need to have someone in on the weekend in order to stay in compliance?*
- A:** Yes, systems will have to conduct this monitoring daily. Systems have 3 or 5 years, depending on source water type and size, to get the plant staffed for conducting the required monitoring or change the disinfectant. This monitoring is required and must be conducted daily due to the acute health risks associated with chlorine dioxide.
- Q:** *What systems are required to monitor for chlorine dioxide and chlorite?*
- A:** All nontransient noncommunity and community systems that use chlorine dioxide, regardless of the purpose, (e.g., disinfection, oxidation, or maintenance of a residual) must monitor for both chlorine dioxide and for the disinfection byproduct, chlorite. Transient noncommunity systems that use chlorine dioxide must monitor for chlorine dioxide, but not for chlorite. There is no provision under the rule for reduced chlorine dioxide monitoring even if the chlorine dioxide is not used for primary disinfection. If the system is using chlorine dioxide intermittently, the system is not required to conduct the daily monitoring for chlorine dioxide and chlorite for days when the chlorine dioxide is not in use or monthly monitoring for chlorite if the chlorine dioxide has not been used at all for the entire month. Monthly monitoring for chlorite is required if chlorine dioxide is used at any time during the month.

- Q:** *If my system is triggered into repeat ClO₂ sampling and I have booster chlorination, the rule says one of the repeat samples must be "as close to the first customer as possible." Does this mean the first customer in the entire distribution system, or the first customer after booster chlorination?*
- A:** The term "first customer" refers to the first customer in the distribution system. However, the sample that is taken at the longest residence time for compliance with ClO₂ monitoring requirements at §141.132(c)(2)(ii) should be downstream of the point of booster chlorination.

1.2 Disinfection Byproducts

1.2.1 TTHM and HAA5

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(79)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.53	Maximum Contaminant Level Goals
§141.64	Maximum Contaminant Levels
§141.131(b)(1), (2)	Analytical Requirements
§141.132(b)(1)(i), (ii), (iii), (iv)	Monitoring Requirements
§141.133(b)(1)(i), (ii), (iii)	Compliance Requirements
§141.134(b)	Reporting and Recordkeeping Requirements

- Q:** *If a system rechlorinates in the distribution system, are these rechlorination stations considered "separate plants" under the Stage 1 D/DBPR?*
- A:** No, these rechlorination stations are not generally considered separate plants for minimum monitoring determinations. However, they should be taken into consideration when developing monitoring plans so that maximum residence time/maximum DBP formation is seen, and depending upon the specifics of the system the state may wish to consider these stations as "separate plants".
- Q:** *The TTHM Rule requires systems to take all required samples within a 24-hour period. The Stage 1 Rule, however, does not specify a time-frame when all the samples need to be collected. When should systems take their required TTHM/HAA5 samples?*
- A:** EPA believes that most systems will find it advantageous to take all their samples in one day but this is not required by the Stage 1 DBPR. However, states may require systems to collect all their TTHM/HAA5 samples within a specified period of time. In either case, systems must specify when their TTHM/HAA5 samples will be taken in their monitoring plan.

- Q:** *With respect to the new compliance requirements for TTHM testing that take effect in 2002 (or 2004 for small systems), when the new TTHM MCL comes into effect, will compliance be calculated based on the samples collected in the 2001 (or 2003) calendar year? Or, are they calculated based on the samples collected during the 2002 (or 2004) calendar year? At what point does the waterworks go out of compliance between the annual average of 0.100 mg/L and 0.080 mg/L?*
- A:** Compliance with the new MCL is based on samples taken beginning in the first quarter of 2002/2004. During the first year of compliance calculation if the sum of fewer than four quarters of data exceeds 0.320mg/L for TTHM or 0.240mg/L for HAA5, the system is immediately in violation (since they will exceed the MCL even if the remaining quarters are zero).
- Q:** *Can you be on routine monitoring for TTHMs and reduced monitoring for HAA5, or vice versa?*
- A:** No, a system cannot qualify for reduced monitoring for one contaminant and not for the other.
- Q:** *Will systems currently on reduced TTHM monitoring for the 1979 TTHM Rule be able to remain on reduced monitoring under the Stage 1 DBPR?*
- A:** Unless these systems conducted TTHM/HAA5 monitoring under the ICR, and have qualified with those samples, they will have to revert to routine monitoring under the Stage 1 DBPR until they re-qualify for reduced monitoring. Systems must have an annual average less than or equal to 0.040 mg/L and 0.030 mg/L for TTHM and HAA5 respectively before they can qualify for reduced monitoring.
- Q:** *To qualify for reduced TTHM and HAA5 monitoring, a Subpart H system must have one year of source water TOC data. To remain on reduced monitoring does the system need to have TOC data (i.e., is this a one time average or a rolling average)?*
- A:** To qualify for reduced TTHM and HAA5 monitoring, a Subpart H system must have one year of source water TOC data with an annual average no more than 4.0 mg/L prior to treatment. To remain on reduced monitoring the Subpart H system's annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L TOC. This is based on a rolling annual average and is not a one-time test. If a plant does not use conventional treatment, it is not required to monitor monthly for TOC for the enhanced coagulation requirement. However, if it wants to qualify for, and remain on, reduced monitoring for TTHM and HAA5, it must monitor monthly for TOC before any treatment.
- Q:** *Will states and systems need to adjust their monitoring and compliance activities based on the quarters created by the publication date of the rules on December 16? (i.e., will states and systems be allowed to start the new quarter on January 1 rather than December 16?)*
- A:** This issue was addressed with a technical correction to the rule published in the *Federal Register* on January 16, 2001. Monitoring and compliance activities will take effect beginning on January 1 following the December 16 compliance dates in the rule as published on December 16, 1998.

- Q:** *Please clarify compliance dates for monitoring under this rule. The rule states that the systems must comply with the rule requirements beginning January 1, 2002, or 2004 depending on the system size and source. What is the definition of beginning? Does this mean that systems must conduct their monitoring for TTHM and HAA5 a year in advance to determine compliance on December 16, 2001 (or 2003)? Or, do they start the monitoring in the first quarter of 2002 (or 2004) to determine compliance after the fourth quarter of 2002 (or 2004)?*
- A:** Monitoring begins in first quarter 2002/2004, with compliance determined after the fourth quarter, if quarterly samples are required. If the TTHM and HAA5 results are less than or equal to 0.080 mg/L or 0.060 mg/L respectively, the PWS is in compliance. If the results are greater than 0.080 mg/L or 0.060 mg/L for systems monitoring annually (or less frequently), the system goes to increased (quarterly) monitoring.
- Q:** *Can states phase out the TTHM rule faster than the DBPR allows?*
- A:** Yes, but only if states adopt and implement the Stage 1 DBPR ahead of schedule.
- Q:** *Can samples be taken for operational purposes and not be used for compliance?*
- A:** Yes. Systems are encouraged to take operational samples as necessary. Operational samples do not have to be used for compliance; however all samples used for compliance purposes must be noted in the system's monitoring plan.
- Q:** *Under the Stage 1 DBPR, if a system must increase its chlorine or chloramine levels to address an emergency (e.g. a main break or other contamination event), and is scheduled to collect DBP samples, should the system reschedule its TTHM/HAA5 sampling?*
- A:** The system is required to monitor during normal operating conditions, this includes changes in disinfection levels caused by water quality fluctuations. However, if the system is experiencing an emergency, and must increase its chlorine or chloramine levels during the period that monitoring is required under the sampling schedule, the system must consult with the state to determine if sampling may be delayed until the emergency has ended, and normal operation is resumed.
- Q:** *How can systems with more than one treatment plant determine compliance if each plant provides a different percentage of the system's supply? Averaging of all of the samples taken from a surface water source providing 90% of the systems water and a ground water plant serving the other 10% may not truly reflect the level of TTHMs and HAA5 in the entire system.*
- A:** EPA believes that for systems with more than one treatment plant, the quarterly average, representative of each treatment plant, should be determined separately. The quarterly average for the entire system should be calculated by weighing the averages for each of the treatment plants (total number of treatment plants = n) as follows:

(Quarterly average for samples representing treatment plant 1)

X (fraction of flow* into system from plant 1)

+ (Quarterly average for samples representing treatment plant 2)

X (fraction of flow* into system from plant 2)

+ ... (Quarterly average for samples representing treatment plant n)

X (fraction of flow* into system from plant n)

= quarterly average for the system

* for the purposes of this determination only, flow is defined as the average daily flow for the subject treatment plant during the subject compliance period.

(Note: this formula is taken directly page 13 of EPA's 1983 Guidance titled: Trihalomethanes in Drinking Water - Sampling, Analysis, Monitoring, and Compliance).

For added explanation, we offer the following based on the above formula:

Plant 1 serves 90% of the water to the system and has a quarterly average of 120 ppb for TTHM and plant 2 serves the other 10% and has a quarterly average of 40 ppb for TTHM or $(120 \times 0.9) + (40 \times 0.1) = 112$ ppb as a quarterly average for the system.

Q: *Assume a system has multiple wells and a single surface water source. Are the TTHM and HAA5 monitoring requirements for each plant, ground water and surface water, based upon the requirements for Subpart H systems?*

A: Yes. A system that uses ground water as well as surface water or ground water under the influence of surface water as part of their source is considered a Subpart H system. The monitoring requirements for all plants are as established in the rule for Subpart H systems. See also Section IV-G: Determining Monitoring Frequency for TTHM and HAA5 Sampling, Mixed Sources (Surface Water and Ground Water), Example SG3.

Q: *If a Subpart H system serving greater than or equal to 10,000 persons has two treatment plants and the distribution system is configured in such a way that one of the samples (e.g., max residence time) is in effectively the same location for both plants can the system use one sample to cover both treatment plants or does the system have to take two samples? In the most simple example, can the system take 7 samples instead of 8 with one sample counting for two?*

A: If a system can demonstrate in its monitoring plan to the satisfaction of the state that a sample taken within the distribution system effectively covers the monitoring requirements for two plants, it could count one sample as meeting the intent of the regulation. States should be reviewing the sampling plan to determine if by not taking a sample the system will still have data reflective of the spacial and temporal conditions in the distribution system for byproduct formation. However, this would not be considered appropriate for systems which are only required to take samples at one location per plant.

Q: *If a system uses surface water to supplement its ground water source on a seasonal basis what kind of system is it, Subpart H or ground water? What is the routine monitoring frequency for TTHM and HAA5 and how does the system qualify for reduced monitoring?*

A: The system would monitor according to the subpart H requirements during any quarter when using either surface water or ground water under the influence of surface water, the sample shall be taken so the results are representative of the surface source. When only using ground water, the system would monitor according to the requirements for a ground water system. (See the table under §141.132) The compliance calculations are based on a running annual average computed quarterly. If the running annual average computed quarterly for TTHM and HAA5 is less than or equal to 0.040 mg/L and 0.030 mg/L, respectively, and meets the TOC levels required for the months that the system uses surface water, the system qualifies for reduced monitoring.

See also Section IV-G: Determining Monitoring Frequency for TTHM and HAA5 Sampling, Mixed Sources (Surface Water and Ground Water), Example SG4.

Q: *How does a system determine its month of warmest water temperature for the purposes of monitoring for TTHM and HAA5 on a yearly or less frequent basis under the Stage 1 DBPR?*

A: Systems should monitor the temperature of their treated water or use historical data to ensure they are collecting samples during the month of warmest water temperatures (i.e. when disinfection byproduct formation is accelerated). For most systems this is likely to occur in July, August, or September. If the system operates during these months, this would likely be the time to take the TTHM and HAA5 samples. Systems that do not operate during these months must take their samples during the warmest month in which they operate. This requirement is designed to allow less frequent monitoring by collecting samples during worst case conditions.

Q: *Why are the levels of TTHM and HAA5 established at lower concentrations to qualify for reduced monitoring than to stay on reduced monitoring once qualified?*

A: Routine monitoring for TTHMs and HAA5 gives an indication of "average" disinfection byproduct occurrence in the distribution system. On the other hand, sampling requirements for reduced monitoring are designed to ensure that the sample measures "worst case" conditions for occurrence of the disinfection byproducts. Thus, these worst case samples are expected to contain higher concentrations of DBPs than the average of routine samples.

Q: *If a system is conducting routine yearly monitoring for TTHM/HAA5 and exceeds the MCL for either DBP in this yearly sample, is the system in violation under the Stage 1 DBPR?*

A: The system is not immediately in violation. The system must increase their monitoring to quarterly the very next quarter. If after a year of quarterly monitoring the system exceeds the MCL as an annual average, the system is in violation. If the system fails to perform all of the quarterly monitoring, compliance will be determined based on the available data and the system will also have a monitoring violation.

Q: *If the system uses an ICR approved lab to do the testing for TTHM and HAA5 in the first year, can it use the data collected to qualify for reduced TTHM and HAA5 monitoring?*

A: If the state approves the lab, then the system can use the data to qualify for reduced TTHM and HAA5 monitoring provided that the data meets all the other D/DBPR compliance sampling and analysis requirements. In addition, Subpart H systems must meet

applicable TOC levels. Systems which collected TTHM and HAA5 data for applicability monitoring under the IESWTR (see Q and A in section 2.2) can use that data if the samples were analyzed by a certified laboratory using approved ICR methods.

Q: *Do TTHM and HAA5 samples have to be collected at the same time and location?*

A: Yes, they should. However, there is no regulatory requirement to sample at the same time and location. The system has to specify locations and schedules for collecting samples in its monitoring plan.

Q: *Does the use of any oxidant mean that my system is required to sample for TTHMs?*

A: A system that uses an oxidant that can also be used as a disinfectant (such as ClO_2 or O_3) must sample for TTHMs. However, a ground water system that uses an oxidant that is NOT a disinfectant (such as KMnO_4 for taste and odor oxidation) and does not add another disinfectant to their water, is not required to monitor for TTHMs.

Q: *Do systems that only add ozone have to monitor for TTHM and HAA5?*

A: Yes, all systems that supply water treated with a chemical disinfectant are required to monitor for TTHM and HAA5.

1.2.2 Bromate

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(80)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.53	Maximum Contaminant Level Goals
§141.64	Maximum Contaminant Levels
§141.131(b)(1), (2)	Analytical Requirements
§141.132(b)(3)(i), (ii)	Monitoring Requirements
§141.133(b)(2)	Compliance Requirements
§141.134(b)	Reporting and Recordkeeping Requirements

Q: *May bromate monitoring be modified for systems based on the population served (as TTHM and HAA5 monitoring is structured)?*

A: No, there are no provisions in the Stage 1 DBPR to monitor for bromate based on system type and/or size.

- Q:** *Do systems using low levels of ozone at the beginning of the plant for purposes of enhancing filtration need to test for bromate under this rule?*
- A:** Yes. The rule specifies that any community or nontransient noncommunity system that uses ozone, for disinfection or oxidation, must take one bromate sample per month per treatment plant using ozone at the entrance to the distribution system. (See §141.132(b)(3))

1.2.3 Chlorite

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(81)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.53	Maximum Contaminant Level Goals
§141.64	Maximum Contaminant Levels
§141.131(b)(1), (2)	Analytical Requirements
§141.132(b)(2)(i), (ii)	Monitoring Requirements
§141.133(b)(3)	Compliance Requirements
§141.134(b)	Reporting and Recordkeeping Requirements

- Q:** *May chlorite monitoring be modified for systems based on the population served (as TTHM and HAA5 monitoring is structured)?*
- A:** No, there are no provisions in the Stage 1 DBPR to monitor for chlorite based on system type and/or size.
- Q:** *Daily monitoring means 7 days a week. Some systems are not staffed on the weekend. Do systems that add chlorine dioxide need to have someone in on the weekend in order to stay in compliance?*
- A:** Yes, systems required to conduct daily monitoring under the Stage 1 DBPR will have to conduct this monitoring daily. The system has 3 or 5 years, depending on its source water type and size, to get the plant staffed for conducting the required monitoring or change their disinfectant. This monitoring is required and must be conducted daily due to the acute health risks associated with chlorine dioxide.
- Q:** *Can you use analytical methods other than those listed in the Federal Register?*
- A:** The methods in the rule must be used.
- Q:** *When we have to do additional sampling because of an exceedence of 1.0 mg/L chlorite at the entrance to the distribution system, say 1.5 mg/L, and chlorite in the distribution is less than that level, can we assume that if the level at the entrance to the distribution system is 1.2 mg/L, the level in the distribution will be lower and forego monitoring?*
- A:** If the system exceeds 1.0 mg/L, the system MUST conduct the additional monitoring (3 samples in the distribution system) the following day.

- Q:** *Do the MCL and monitoring requirements for chlorite apply to transient systems that use chlorine dioxide?*
- A:** The MCL and monitoring requirements for chlorite apply only to community and nontransient noncommunity systems that use chlorine dioxide. Chlorite is not regulated for transient systems.
- Q:** *Does EPA intend for daily chlorite samples to be sent out to a certified laboratory for analysis or could systems do hand held testing at the entrance to the distribution system for chlorite?*
- A:** The original rule requires that the analysis be performed by a certified laboratory, however, EPA updated the rule through technical corrections published in the *Federal Register* on January 16, 2001 to allow daily chlorite sampling and analysis to be performed by a party approved by the state.

1.3 Disinfection Byproduct Precursors

For further information, see the following rule sections:

Citation	Part Title
§141.32(e)(79)	Public Notification
§141.201	Public Notification of Drinking Water Violations
§141.131(d)(1), (2), (3), (4), (5)	Analytical Requirements
§141.132(d)(1), (2)	Monitoring Requirements
§141.133(d)	Compliance Requirements
§141.134(d)	Reporting and Recordkeeping Requirements
§141.135 [entire part]	Treatment Technique for Control of DBP Precursors

- Q:** *Do lime softening plants need to consider alternative compliance criteria and/or Step 1 TOC removal requirements or can they go right to the Step 2 bench-scale testing?*
- A:** EPA believes that all lime softening plants will meet at least one of the alternative compliance criteria, one of the additional alternative compliance criteria for softening plants, or will be able to achieve step 1 TOC removal requirements. The Step 2 bench testing procedures are not designed for softening systems since the step 2 procedure is designed to lower pH while the softening process raises pH. Thus Step 2 does not apply to softening systems.
- Q:** *Some treatment plants operate seasonally. How do you determine quarterly averages?*
- A:** These systems must use the average of the available data in each quarter the plant operates.
- Q:** *Would you ever end up with a treated water TOC higher than an untreated source water TOC?*
- A:** This may happen as a result of the analytical methods used to measure TOC where minor variations (measurement error) may show a treated water TOC slightly higher than a source water TOC level.

- Q:** *When the treated water TOC level is greater than the untreated water TOC level, what number should be used in the monthly calculation?*
- A:** There are two ways to calculate compliance with the Step 1 TOC removal requirements. The first is to calculate the actual percentage of TOC removal from the source and treated waters for that month [141.135(c)(1)(i)]. In any month where the treated water TOC level is greater than the source water TOC level, the monthly calculation would be a negative number. Second, the system could use an alternative compliance calculation method. For example, if the system's treated or source water TOC is less than 2.0 mg/L the system would assign the value of 1.0 for that month. For any month that a system practicing softening removes at least 10 mg/L of hardness (as CaCO₃) the system would assign the value of 1.0 for that month [141.135(c)(2)(i)].
- Q:** *Does the addition of a disinfectant affect where and when source water TOC sampling is performed?*
- A:** Yes, TOC monitoring must occur before any disinfectant is added into the system.
- Q:** *If a system meets one of the alternative compliance criteria is it exempted from implementing enhanced coagulation?*
- A:** If a system meets one of the alternative compliance criteria as a running annual average, calculated quarterly, they are in compliance with the precursor removal treatment technique and do not have to meet the Step 1 TOC removal requirements. For those systems that must implement enhanced coagulation or enhanced softening, alternative compliance criteria can also be used for compliance calculations on a month-by-month basis. (See § 141.135(c)(2))
- Q:** *If a system has met the same alternative compliance criterion for the past four quarters does this mean it is in compliance for the previous year or for the following year?*
- A:** This system is in compliance for the previous year.
- Q:** *Does a system always have to use the same alternative compliance criterion to avoid employing enhanced coagulation?*
- A:** In order to avoid employing enhanced coagulation, the system must meet the same alternative compliance criterion for the past four quarters to calculate a running annual average. If it cannot meet this same criterion for four quarters, the system is required to perform enhanced coagulation and perform the compliance calculations required in §141.135(c). However, once a system is required to employ enhanced coagulation, they may employ alternative compliance criteria on a month-by-month basis (§141.135(c)(2)(i)-(v)) in lieu of performing the calculations in §141.135(c)(1). Alternative compliance criteria used on a month-by-month basis for calculating compliance can change depending on the time of year and the characteristics of the water.
- Q:** *If I meet an alternative compliance criterion for the month and have exceeded the Step 1 removal requirements, should I use 1.0 or the calculated number in my compliance calculations?*
- A:** You should use the calculated number, since if you exceed the Step 1 removal requirements, this number will be greater than 1.0. This number will "help" the quarterly average you calculate assuming you have a month where your TOC percent removal ratio is less than 1.0.

- Q:** *Does the state need to approve all TOC percent removal levels under the Stage 1 DBPR?*
- A:** The state is only required to approve the Step 2 removal levels, not the Step 1 TOC removal levels.
- Q:** *What should a conventional softening system do if it must meet the TOC removal requirements under the Stage 1 DBPR by dropping alkalinity and then must recarbonate to adjust pH and alkalinity for achieving compliance with the Lead and Copper Rule?*
- A:** The system may use either the TOC percentage removal requirement or the alternative compliance criteria (less than 60 mg/L (as CaCO₃) to comply with the rule. The system may then recarbonate to comply with the Lead and Copper Rule. Treated water alkalinity, for purposes of compliance with the Stage 1 DBPR, should be measured prior to recarbonation and may be measured anywhere in the treatment plant.
- Q:** *Do labs have to be certified to conduct TOC monitoring?*
- A:** A system must use a party approved by EPA or the state to measure TOC, with any of the methods specified in the regulations. Use of a certified laboratory is not required.
- Q:** *Is GAC effective in removing DBPs? May it be used by conventional plants in lieu of the treatment technique for DBP precursor removal under the Stage 1 DBPR?*
- A:** The system may use GAC if it provides adequate TOC removal to allow the system to meet either Step 1 or one of the alternative compliance criteria for finished water. GAC is effective depending on the type of carbon used, the contact time, and the nature of the DBPs. Depending on the type of carbon used, it can also be expensive and cause operational and disposal problems. EPA recommends that systems not use GAC for removal of DBPs after flocculation but instead use it for DBP precursor (TOC) removal, if necessary. GAC can be used to "enhance" enhanced coagulation and TOC removal in conventional plants. However, because GAC tends to work most effectively when used in tandem with enhanced coagulation rather than in lieu of, it is not normally a substitute for DBP precursor removal.
- Q:** *How often does a system doing Step 2 have to perform bench- or pilot-scale testing?*
- A:** The rule only requires that it be performed; the frequency is determined by the state. In the EPA guidance on Enhanced Coagulation, the recommended frequency for the Step 2 bench- or pilot-scale testing is at least quarterly for the first year. If source water quality changes significantly on a more frequent basis, Step 2 testing may need to be conducted more frequently. The minimum levels of TOC removal will be determined by this testing and established as regulatory requirements by the state.
- The guidance manual (EPA 815-R-99-012) is available at EPA's website: www.epa.gov/safewater/mdbp/implement.html or from NSCEP at 1.800.490.9198.
- Q:** *Why are enhanced coagulation and enhanced softening only required at conventional plants?*
- A:** Enhanced coagulation and enhanced softening involve the addition of higher levels of coagulants (i.e., higher than is required for turbidity removal). Therefore, a sedimentation (solids removal) process is necessary to remove solids prior to filtration. Without sedimentation, the solids would plug the filters, and result in short filter runs and poor

operation. In the Stage 1 DBPR, the precursor removal requirements apply to those systems best able to remove DBP precursors at relatively low cost.

Q: *Do you change Step 2 TOC removal requirements when there is a routine seasonal change in source water quality?*

A: The frequency of the Step 2 bench- or pilot-scale testing is determined by the state. In the EPA guidance on Enhanced Coagulation, the recommended frequency for the Step 2 bench- or pilot-scale testing is at least quarterly for the first year. If source water quality changes significantly on a more frequent basis, Step 2 testing may need to be conducted more frequently. The minimum levels of TOC removal will be determined by this testing and established as regulatory requirements by the state. In addition, it may vary on a seasonal basis if approved by the state.

The EPA guidance manual (EPA 815-R-99-012) is available at www.epa.gov/safewater/mdpb/implement.html or from NSCEP at 1.800.490.9198

Q: *For the "simultaneous" paired sample, what is the time-lag allowed between samples (accounting for detention time)?*

A: The rule requires the paired samples to be collected "at the same time." In practice EPA expects that systems will typically collect the source water sample followed, in a few minutes to a few hours, by the treated water sample. In situations where raw water quality fluctuates frequently, the system may need to provide a time-lag between the samples equal to the residence time of the water between sampling points. This will ensure the samples accurately reflect the actual TOC removal. In all cases systems should address their sampling procedure in their monitoring plans.

Q: *If a system treats blended water from two very different source waters (one source meets an alternative compliance criterion, the second source does not) may the system forego enhanced coagulation?*

A: The enhanced coagulation/enhanced softening requirements are based on the source water TOC and alkalinity. All measurements and compliance determinations must be made on the water that is actually treated in the plant under normal operating conditions. If that water is comprised of a blend from multiple sources, the composition of the blend will determine whether alternative compliance criteria are met or whether achieving the minimum TOC removal requirements of enhanced coagulation is necessary.

Q: *What if for one month water is not amenable to enhanced coagulation?*

A: Compliance is based on a running annual average. The system may elect to use the calculated data, use an alternative compliance criterion (if possible) that month, or apply for a Step 2 removal requirement for the month.

Q: *If a system is unable to meet any alternative compliance criteria or Step 1 TOC removal requirements in the first quarter of monitoring, can it decide to go to Step 2 immediately, rather than waiting for the full year of data collection?*

A: The system may elect to conduct the necessary bench-scale testing immediately but because compliance is based on a running annual average, the system is not eligible for Step 2 removal until one year of data have been collected.

- Q:** *If a system, through excessive lime softening, lowers the alkalinity to below 60 mg/L and/or removes at least 10 mg/L of magnesium hardness and, therefore, meets one or more of the compliance criteria, why does it need to do the TOC monitoring? Do states have the flexibility to allow such systems to forego TOC monitoring?*
- A:** States do not have the flexibility to allow systems to forego TOC monitoring. EPA believes that systems may not always meet one of the alternative compliance criteria, and that the system needs to have the data in such cases to determine compliance. Additionally, in order to qualify for, and remain on, reduced monitoring for TTHM and HAA5 these Subpart H systems must continue to perform monthly TOC monitoring of untreated source water.
- Q:** *If a softening system wishes to use the additional alternative compliance criteria for softening systems and its jar-testing demonstrates a finished water alkalinity below 60 mg/L, but samples in the plant that incorporate the prescribed coagulant dose still exceed 60 mg/L, is the system in compliance with the Step 2 requirements?*
- A:** There are no Step 2 provisions for softening systems. The alkalinity or magnesium hardness removal levels must be met in the full-scale plant. For non-softening systems, Step 2 determines a removal requirement, not a coagulant dose requirement.
- Q:** *How should the state deal with the situation where the full-scale results do not achieve the required step 2 TOC removals predicted by jar testing?*
- A:** Failure to meet step 2 TOC removal requirements results in a violation. The system should be encouraged to experiment with acids, alternative coagulants, etc. to improve TOC removal and ensure compliance.
- Q:** *May a system grandfather Step 2 jar testing results in advance of the effective date of the Stage 1 D/DBPR requirements provided that the system meets all the technical criteria specified in the rule?*
- A:** To meet the special primacy requirements, the state has to develop Step 2 methodology. If a system wishes to begin testing early, the system should ensure that the state has submitted its Step 2 methodology to EPA for approval.
- Q:** *If there is a group of surface water intakes close to each other, can they do one raw water TOC sample?*
- A:** No, Because the TOC levels in surface water can vary greatly by time and location in a water body. Plants are required to take TOC samples at each intake, because the samples must reflect the treated water samples.
- Q:** *Section 141.135(b)(3) says that once the state approves a Step 2 TOC removal percentage, the state may make that percentage retroactive. However, Section 141.133(d) says that systems which do not meet the Step 1 requirements during the first 12 months are not eligible for retroactive approval of Step 2 requirements. Which is correct?*
- A:** Both are correct. Section 141.133(d) limits what may be done in the first year for a system which elects to enter the compliance period uninformed. Systems may begin monitoring in 2001/2003 to determine whether Step 1 levels can be met. This monitoring is not mandatory and failure to monitor during the 12 months prior to the compliance date is not a violation. However, failure to conduct this monitoring makes a system ineligible for retroactive approval of a step 2 alternative TOC removal level during 2002/2004. After 2002/2004, all systems are eligible for retroactive step 2 approval, whether the early monitoring was conducted or not. The M-DBP FACA negotiating committee and EPA

believed that systems should not be allowed to claim ignorance of whether compliance had been achieved, but also recognized that future changes in source water quality may affect a system's ability to achieve compliance. To balance these two, the rule allows for retroactive approval of Step 2 criteria if the system has data that indicates that the system has taken prudent measures to comply. Failure to determine compliance status is not prudent. Such retroactive approval is not available for MCL compliance or for compliance with other treatment techniques.

Q: *How does a system that is treating for zebra mussel control by injecting chlorine at the intake collect untreated source water samples for TOC?*

A: The system may have to discontinue its chlorine feed for a brief period in order to collect the sample. Alternatively, the state may allow a grab sample at the entrance to the intake to the plant before any treatment. This situation should be addressed in the system's monitoring plan.

Q: *TOC measurements are limited to two significant figures. The use of these values in compliance calculations under §141.135(c) cannot produce a value with a greater number of significant figures. However, systems are required to compare the value calculated for compliance to 1.00 which has three significant figures. How do you reconcile this?*

A: The increase in significant figures was an oversight by EPA. The intent was for systems to compare the calculated value at two decimal places.

1.4 Monitoring

1.4.1 General Monitoring Issues

Q: *How do you determine TOC levels to qualify for or remain on reduced monitoring for TTHM and HAA5 if you have multiple treatment plants? Can you have reduced monitoring for one plant and not another? Or should all the plants be treated the same?*

A: Systems cannot be on reduced monitoring for TTHM and HAA5 at one of their plants and routine monitoring for another because compliance is based on the TTHM and HAA5 levels for the entire system. Each plant's source water TOC level must be less than or equal to 4.0 mg/L.

Q: *If you have both ground water and surface water the system is considered to be a Subpart H system. As a Subpart H system, is it required to follow the monitoring for Subpart H systems for all of their treatment plants including ground water plants?*

A: Yes. If the system is a Subpart H system the monitoring requirements for Subpart H systems apply to all plants whether ground water or surface water.

Q: *How does a system (either ground water or surface water) determine the month of warmest water temperature, when there is little or no temperature variability?*

A: To meet this requirement systems should regularly monitor their source and distribution water temperatures or use historical data. In cases where the water temperature is very constant, the system may consult with the state regarding the proper month in which to conduct sampling. The results of this consultation would then be incorporated into the

system's monitoring plan. The state may also be able to better spread out the monitoring to avoid lab capacity issues.

1.4.2 Monitoring Plans

For further information, see the following rule sections:

Citation	Part Title
§141.132(a)(1), (2), (3)	Monitoring Requirements (General requirements)
§141.132(f)(1), (2), (3)	Monitoring Requirements (Monitoring plans)

Q: *Under the Stage 1 DBPR, when does the monitoring plan need to be completed?*

A: The monitoring plan must be complete and available for inspection by the state and public no later than 30 days following the applicable compliance dates in § 141.130(b). Subpart H systems > 3,300 must submit their monitoring plans with their first monitoring report.

Q: *Do all monitoring plans have to be reviewed and approved by the state to ensure the system is planning monitoring that will achieve compliance in all areas of the Stage 1 DBPR?*

A: States are encouraged to review or approve monitoring plans. States will generally check the monitoring plans during the sanitary surveys or other visits. Subpart H systems serving >3,300 must submit monitoring plans to the state for review. States may require plans to be submitted by any other system and may require changes to the plan.

Q: *How should a system determine residence times and conduct monitoring under the Stage 1 DBPR if it has a complicated distribution system?*

A: This should be addressed in the monitoring plan for the system and should be reviewed by the state to ensure the system will be in compliance. In the monitoring plan, the system should indicate why samples are being taken in a particular location. EPA intends for sites to be generally selected based on best professional judgement rather than on computer analyses and tracer studies.

Q: *Is there a restriction on how often a system can revise their monitoring plan?*

A: The frequency of allowable modifications to the monitoring plan is not addressed in the rule. Clearly changes in sources, disinfectants, etc. will make modifications necessary and sometimes unpredictable. EPA believes this is best left up to states' discretion. Any time a Subpart H system serving greater than 3,300 people modifies its sampling plan, the system must submit this modified sampling plan to the state.

1.4.3 Multiple Wells Drawing from a Single Aquifer

For further information, see the following rule sections:

Citation	Part Title
§141.132(a)(2)	Monitoring Requirements (General requirements)

- Q:** *If a system has multiple wells drawing from the same aquifer, what is the monitoring frequency for TTHM and HAA5?*
- A:** The wells may be treated as one plant for the purposes of determining monitoring frequency for TTHM and HAA5. This is true even if each well or some of the wells have their own treatment.
- Q:** *If a system has one treatment plant with multiple wells from different aquifers, how is the monitoring frequency determined?*
- A:** If all the sources are combined into a single treatment plant, the number of samples required for that plant is determined by system size.

1.4.4 Reporting and Recordkeeping

For further information, see the following rule sections:

Citation	Part Title
§141.134(b) & (c)	Reporting and Recordkeeping Requirements

- Q:** *Section 141.134, reporting and recordkeeping requirements for TTHM/HAA5, chlorite, bromate, chloramines and chlorine, requires systems to report "whether the MCL (or MRDL) was exceeded." The requirements for systems monitoring for chlorine dioxide, on the other hand, are to report "whether the MRDL was exceeded" and "whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or chronic." Does the requirement to report "whether the MCL (or MRDL) was exceeded," mean the system should report any single sample that exceeds the MCL (or MRDL) or only report exceedences that result in violations?*
- A:** For each compliance period, Systems are required to report results of all samples whether or not they exceed the MCL or MRDL, they are also required to report any violations of the MCL or MRDL, based upon the compliance determination for the monitoring period for which they are reporting.

1.4.5 Consecutive Systems

For further information, see the following rule sections:

Citation	Part Title
§141.132(f)(3)	Monitoring Requirements (Monitoring plans)

- Q:** *Will a wholesale system be required to change its treatment process if there is an MCL or MRDL exceedence in system that purchases its water?*
- A:** Each system is responsible for achieving and maintaining compliance. In most cases EPA expects wholesalers to cooperate with purchased water systems to ensure their compliance but, as previously mentioned, each water system is ultimately responsible for its own compliance.
- Q:** *Does this rule apply to consecutive systems that buy chlorinated water and that do not add a chemical disinfectant?*
- A:** EPA believes that all consumers should be protected against DBPs. EPA anticipates clarifying requirements for those systems in the Stage 2 DBPR. Until the Stage 2 rule is finalized, EPA anticipates that states will specify how consecutive systems that purchase disinfected water but do not add a disinfectant must monitor.

2.0 General Program Requirements

2.1 Primacy

- Q:** *If the state has a blanket letter from the Attorney General that covers all regulations, does it have to get a new letter specifically for the Stage 1 DBPR?*
- A:** Yes. States would not be able to use a letter from the Attorney General that provided certification of rules not in existence at the time the certification letter was written. The certification would also have to confirm that there are no state audit laws preventing enforcement of the rules.
- Q:** *Do you need to adopt the PWS definition (if applicable) and obtain administrative penalty authority in order to receive interim primacy for the Stage 1 DBPR?*
- A:** A state is eligible for interim primacy for new regulations provided they have primacy or interim primacy for all existing regulations. At a time when multiple regulations are being promulgated, a state qualifies for interim primacy for each rule as the rules are adopted by the state as long as the time period allowed for adoption (two years plus up to a two year extension, if applicable) has not expired. For example, even though the CCR was promulgated before the Stage 1 DBPR, a state can obtain interim primacy for the Stage 1 DBPR before the CCR, as long as the deadline to adopt the CCR has not passed. However, if time period allow for adoption of the CCR has passed and the state has not adopted the CCR, then the state would not be eligible for interim primacy for the Stage 1 DBPR.

- Q:** *Can states "bundle" regulations in their primacy revision package?*
- A:** Yes, states may combine two or more rules in one primacy revision package provided that the states' adoption of the rules falls within the statutory two year period and two year extension period, if applicable.
- Q:** *May a state adopt the Stage 1 DBPR by reference?*
- A:** Yes, if the state law allows this. However, the state will still need to address the special primacy requirements which give the state flexibility and discretion in meeting certain requirements.
- Q:** *Our State's Attorney General does not have the authority to approve regulations. Will this be a problem for us in terms of obtaining primacy for new rules?*
- A:** EPA does not require the State's Attorney General to provide approval of regulations adopted for purposes of the state achieving primacy under these rules. The requirement is for a statement by the Attorney General, or the primacy agency's attorney if it has independent legal council, that the laws and regulations adopted by the state were duly adopted and are enforceable.

2.2 Violations, SDWIS Reporting and SNC Definitions

- Q:** *If a system receives 2 treatment technique violations in 1 month, is that counted as two TT violations toward SNC?*
- A:** Yes.
- Q:** *How frequently are SNC determinations made? Can a system potentially receive a SNC designation every month? every quarter? every year?*
- A:** Significant Non-Compliance (SNC) determinations for all rules, including the Interim Enhanced Surface Water Treatment Rule (IESWTR) and the Stage 1 Disinfectants/Disinfection Byproducts Rule (DBPR), are made once per quarter, compounding over a rolling four quarter period. SDWIS guidance states that these determinations are made on the first day of the month following the end of the quarter which covers the 12 month compliance period which ended the previous quarter.

2.3 Qualified Operators

- Q:** *There is a requirement of the SWTR that the systems be operated by qualified personnel. What if the system has a membrane plant that is not operated on a full time basis? EPA has not mandated the number of hours in a operating cycle and systems have been installing membrane plants to prevent being required to have a full-time operator.*
- A:** Both the Surface Water Treatment Rule and the Stage 1 Disinfectants/Disinfection Byproducts Rule require regulated systems to be operated by qualified personnel who meet the requirements specified by the state and are included in a state register of qualified operators. The rules do not, however, address the amount of time qualified operators are required to spend on site at the plant. EPA believes that this type of determinations should be left to the states' discretion.

Q: *Who in the state must maintain the list of qualified operators? Is it acceptable if the Public Water Supply Supervision Program (PWSS) does not maintain the list, but another agency in the state does?*

A: Yes, it is acceptable for a state agency other than the primacy agency to maintain the state's register of qualified operators. It is essential, however, for the PWSS Program to have access to that register.

IV-E. Determining Monitoring Frequency for TTHM and HAA5 Sampling

The number of samples a system must take for TTHMs & HAA5s is based upon the type of water (surface water or ground water or combination of both), population size, and the number of water treatment plants (WTPs) a system has. However, this determination is sometimes complicated due to the many different configurations a system may have. The following examples help illustrate the WTP concept for determining the number of samples a system must take for TTHMs & HAA5s.

Surface Water Sources

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (§141.132)

<u>Type of system</u>	<u>Minimum Monitoring Frequency</u>
Surface water or ground water under direct influence of surface water serving at least 10,000 persons	Four water samples per quarter per treatment plant
Surface water or ground water under direct influence of surface water serving from 500 to 9,999 persons	One water sample per quarter per treatment plant
Surface water or ground water under direct influence of surface water serving fewer than 500 persons	One sample per year per treatment plant during month of warmest water temperature

- S1 A system serves $\geq 10,000$ people and has two surface water treatment plants. However, the water from both plants is combined prior to entering the distribution system. How many WTPs does this system have?

This system has one WTP and would take four samples per quarter. In general, as long as the water is combined and therefore being mixed prior to entering the distribution system the system has one WTP for monitoring purposes.

- S2 A system serves $\geq 10,000$ people and has two surface water treatment plants that are drawing water from the same river but at different locations and enter the distribution system at different locations. How many WTPs does this system have?

This system has two WTPs and would take eight samples per quarter. They are considered two WTPs even though they draw water from the same river because the treatment in the two plants cannot be exactly the same. Additionally, the treated waters do not have an opportunity to mix prior to entering the distribution system because they enter at two different locations.

- S3 A system serves $\geq 10,000$ people and has one surface water treatment plant. The system also utilizes another surface water treatment plant during high demand times from May to September. During these high demand times, water from the second plant enters the distribution system at a different location from the first plant. How many WTPs does this system have?

This system would have one WTP in the first and fourth quarters and would take four samples per quarter for those quarters. However, for the second and third quarters this system would have two WTPs and would need to take eight samples per quarter for those quarters.

Ground Water Sources

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (\$141.132)

Type of system	Minimum Monitoring Frequency
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	one water sample per quarter per treatment plant ¹
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	one sample per year per treatment plant ¹ during month of warmest water temperature
¹ Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with state approval.	

- G1 A system serves $\geq 10,000$ people and has thirty-three wells that the state has determined all come from one aquifer. The water from these wells enter the distribution system in thirty-three different locations. How many WTPs does this system have?

This system has one WTP and would take one sample per quarter. In general, as long as the wells have been determined by the state to come from the same aquifer, the system has one WTP for monitoring purposes.

- G2 A system serves $\geq 10,000$ people and has twenty-eight wells that the state has determined to come from fourteen aquifers. All the wells enter the distribution system in different locations. How many WTPs does this system have?

This system has fourteen WTPs and would take fourteen samples per quarter.

- G3 A system serves $\geq 10,000$ people and has ten wells that the state has determined to come from ten aquifers. The wells are paired such that two wells go into one pipe where the water is disinfected and then enters the distribution system in five different locations. How many WTPs does this system have?

This system would have five WTPs and would have to take five samples per quarter. The number of WTPs is reduced because the water from each pair of wells are combined into a single pipe, treated and mixed prior to entering the distribution system.

- G4 A system serves $\geq 10,000$ people and has ten wells that the state has determined to come from ten different aquifers. These wells enter the distribution system at ten different locations. However,

the system only uses all ten wells during high demand times from May through August. The remainder of the year, the system only uses five wells. How many WTPs does this system have?

This system would have five WTPs in the first and fourth quarters and would take five samples per quarter for those quarters. For the second and third quarters this system would have ten WTPs and would take ten samples per quarter for those quarters.

MIXED SOURCES (SURFACE WATER AND GROUND WATER)

- SG1 A system serves $\geq 10,000$ people and has one surface water treatment plant. The system also purchases finished surface water from one system and disinfected ground water from another system. The purchased surface water and purchased ground water are not further disinfected. All three sources of water enter the distribution system at different locations. How many WTPs does this system have?

This system has one WTP and would take four samples per quarter. However, the three sources represent three different qualities of water with differing treatment and DBP formation potential. This system could be considered as having three WTPs and therefore would take twelve samples per quarter, but there is no federal requirement to do so.

- SG2 A system serves $\geq 10,000$ people and has one surface water treatment plant. The system also purchases finished surface water from one system and disinfected ground water from another system. The purchased surface water and purchased ground water are further disinfected by the purchasing system. All three sources of water enter the distribution system at different locations. How many WTPs does this system have?

Since a disinfectant has been added to the purchased sources, the Stage 1 DBPR applies to all three sources. This system would have three WTPs and would take twelve samples per quarter.

- SG3 A system serves $\geq 10,000$ people and has one surface water treatment plant and another water treatment plant from wells drawing from a single aquifer. How many WTPs does this system have?

Since the system uses surface water, the monitoring requirements for subpart H systems (SW or GWUDI) take precedence and apply to all WTPs irrespective if they are from ground or surface water. This system would have two WTPs and would have to collect eight samples per quarter.

- SG4 A system serves $\geq 10,000$ people and has a water treatment plant from wells the state has determined are drawing water from a single aquifer. This system also supplements their supply with a surface water treatment plant in the second and third quarters. Both sources enter the distribution system at different locations. How many WTPs does this system have?

This system would have one WTP in the first and fourth quarters and would take one sample per quarter for those quarters. However, since the system uses surface water in the second and third quarters, the monitoring requirements for subpart H systems (SW or GWUDI) take precedence.

This system would have two WTPs in the second and third quarters and would have to collect eight samples per quarter for those quarters.

- SG5 A system serves $\geq 10,000$ people and has eighty-six wells that the state has determined to come from thirty-eight aquifers. The system also has three surface water treatment plants. The water from one of the surface water treatment plants is purchased from another system. Water from all the sources are combined into one pipe prior to entering the distribution system. How many WTPs does this system have?

This system has one WTP since all the sources are combined prior to entering the distribution system and would have to take four samples per quarter since the system uses surface water. In general, as long as the water is combined and therefore being mixed prior to entering the distribution system the system has one WTP for monitoring purposes.

Appendix A

Primacy Revision Crosswalks

The Primacy revision crosswalk for the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) is presented on the following pages and includes the amendments published on January 16, 2001. Regulatory language which was amended on January 16, 2001 appears underlined in the following table.

Under 40 CFR 142.12, states must adopt the requirements of the Stage 1 DBPR within 2 years of the final rule's publication, or by December 16, 2000. While states may find it easier to combine the amendments to the Stage 1 DBPR with the original Stage 1 DBPR, the amendments must be adopted within 2 years their publication or by January 16, 2003.

Please note there have been many changes to the Public Notice (PN) and Consumer Confidence Report (CCR) rules since the publication of Stage 1 DBPR. Additional information on these changes is available at www.epa.gov/safewater/pn.html and www.epa.gov/safewater/ccr1.html.

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PRIMACY REVISION CROSSWALK FOR THE STAGE 1 DBPR

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
SUBPART A—GENERAL			
§ 141.2 DEFINITIONS			
Enhanced coagulation	§ 141.2		
Enhanced softening	§ 141.2		
GAC 10	§ 141.2		
Haloacetic acids (five) (HAA5)	§ 141.2		
Maximum Residual Disinfectant Level (MRDL)	§ 141.2		
Maximum Residual Disinfectant Level Goal (MRDLG)	§ 141.2		
Subpart H Systems	§ 141.2		
Specific Ultraviolet Absorption (SUVA)	§ 141.2		
Total Organic Carbon (TOC)	§ 141.2		
SUBPART B—MAXIMUM CONTAMINANT LEVELS			
§ 141.12 MAXIMUM CONTAMINANT LEVELS FOR TOTAL TRIHALOMETHANES			
Maximum contaminant level for TTHM applies to Subpart H CWSs that serve 10,000 or more people until December 31, 2001; level applies to ground water CWSs that serve 10,000 or more people until December 31, 2003.	§ 141.12		
SUBPART C—MONITORING AND ANALYTICAL REQUIREMENTS			
§ 141.30 TOTAL TRIHALOMETHANES SAMPLING, ANALYTICAL AND OTHER REQUIREMENTS			
Compliance with §141.12 shall be based on running annual average of quarterly samples collected by the systems as prescribed in (b)(1) or (2)	§ 141.30(d)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Sampling and analysis made pursuant to this section shall be conducted by one of the total trihalomethanes methods as directed in § 141.24(e), and the Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994	§ 141.30(e)		
Before a CWS makes any significant modifications to its existing treatment process for the purposes of achieving compliance with § 141.12 the systems must submit and obtain state approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by the system will not be adversely affected by the modification	§ 141.30(f)		
Requirements in (a) through (g) apply to Subpart H CWSs that serve 10,000 or more people until December 31, 2001; requirements in (a) through (g) apply to ground water CWSs that use a disinfectant and serve 10,000 or more people until December 31, 2003.	§ 141.30(h)		
SUBPART D & SUBPART Q—REPORTING, PUBLIC NOTIFICATION AND RECORDKEEPING NOTE: If the revised PN rule, published on May 4, 2000 (65 FR 25981), has already been adopted, the state is not required to adopt § 141.32(e)(10). The revised PN rule supercedes § 141.32. If the revised PN rule has not been adopted, the state must satisfy § 141.32(e)(10).			
§ 141.32 PUBLIC NOTIFICATION			
For violations of the MCLs of contaminants and MRDLs of disinfectants that may pose an acute risk to human health, by furnishing a copy of the notice to radio and television stations serving the area served by the PWS as soon as possible but in no case later than 72 hours after the violation	§ 141.32(a)(1)(iii)		
Violation of the MRDL for chlorine dioxide as defined in § 141.65 and determined according to § 141.133(c)(2)	§ 141.32(a)(1)(iii)(e)		
Owner/operator of CWS must give copy of the most recent public notice for any outstanding violation of any MCL, any MRDL, or any treatment technique requirement, or any variance or exemption to all new billing units or new hookups prior to or at the time service begins	§ 141.32(c)		
Chlorine public notification language	§ 141.32(e)(76)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Chloramines public notification language	§ 141.32(e)(77)		
Chlorine Dioxide public notification language	§ 141.32(e)(78)		
Chlorine Dioxide Nonacute Violations public notification language	§ 141.32(e)(78)(i)		
Chlorine Dioxide Acute Violations public notification language	§ 141.32(e)(78)(ii)		
Disinfection Byproducts and Treatment Technique for DBPs public notification language	§ 141.32(e)(79)		
Bromate public notification language	§ 141.32(e)(80)		
Chlorite public notification language	§ 141.32(e)(81)		
SUBPART F—MAXIMUM CONTAMINANT LEVEL GOALS AND MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS¹			
§ 141.53 MAXIMUM CONTAMINANT LEVEL GOALS FOR DISINFECTION BYPRODUCTS			
Bromodichloromethane: zero Bromoform: zero Bromate: zero Dichloroacetic acid: zero Trichloroacetic acid: 0.3 mg/L Chlorite: 0.8 mg/L Dibromochloromethane: 0.06 mg/L	§ 141.53		
§ 141.54 MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS FOR DISINFECTANTS			
Chlorine: 4 mg/L (as Cl ₂) Chloramines: 4 mg/L (as Cl ₂) Chlorine dioxide: 0.8 mg/L (as ClO ₂)	§ 141.54		

¹States need not have corresponding MCLGs and MRDLs.

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
SUBPART G—MAXIMUM CONTAMINANT LEVELS AND MAXIMUM RESIDUAL DISINFECTANT LEVELS			
§ 141.64 MAXIMUM CONTAMINANT LEVELS FOR DISINFECTION BYPRODUCTS			
Total trihalomethanes: 0.080 mg/L Haloacetic acids (five): 0.060 mg/L Bromate: 0.010 mg/L Chlorite: 1.0 mg/L	§ 141.64(a)		
Subpart H systems serving 10,000 or more people must comply with this section beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and ground water systems must comply with this section beginning January 1, 2004	§ 141.64(b)(1)		
System installing GAC or membranes may apply to state for extension of up to 24 months past the compliance dates but not beyond December 31, 2003; state must set a schedule for compliance and may specify interim measures that the system must take; failure to meet the schedule or the interim requirements constitutes a violation of the NPDWRs	§ 141.64(b)(2)		
BATs for TTHMs, HAA5, Bromate, Chlorite	§ 141.64(c)		
§ 141.65 MAXIMUM RESIDUAL DISINFECTANT LEVELS			
Chlorine: 4.0 mg/L (as Cl ₂) Chloramines: 4.0 mg/L (as Cl ₂) Chlorine Dioxide: 0.8 mg/L (as ClO ₂)	§ 141.65(a)		
CWSs and NTNCWSs: Subpart H systems serving 10,000 or more people must comply with this section beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and ground water systems must comply with this section beginning January 1, 2004	§ 141.65(b)(1)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
TNCWSs: Subpart H systems using chlorine dioxide and serving 10,000 or more people must comply with the MRDL beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and using chlorine dioxide must comply with the chlorine dioxide MRDL beginning January 1, 2004	§ 141.65(b)(2)		
BATs for MRDLs	§ 141.65(c)		
SUBPART L—DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS			
§ 141.130 GENERAL REQUIREMENTS			
Requirements are NPDWR	§ 141.130(a)		
Regulations establish criteria under which CWSs and NTNCWSs which add a disinfectant to their water in any part of the treatment process must modify their practices to meet the MCLs and MRDLs in §141.64 and §141.65 and must meet treatment technique requirements for DBP precursors in §141.135	§ 141.130(a)(1)		
Regulations establish criteria under which transient NCWSs that use chlorine dioxide must modify their practices to meet the MRDL for chlorine dioxide in §141.65	§ 141.130(a)(2)		
EPA has established MCLs for TTHM and HAA5 and treatment technique requirements for DBP precursors	§ 141.130(a)(3)		
CWSs and NTNCWSs: Subpart H systems serving 10,000 or more people must comply with this subpart beginning January 1, 2002; Subpart H systems serving fewer than 10,000 persons and ground water systems must comply with this subpart beginning January 1, 2004	§ 141.130(b)(1)		
TNCWs Subpart H systems serving 10,000 or more people and using chlorine dioxide must comply with this subpart beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and ground water systems using chlorine dioxide must comply with this subpart beginning January 1, 2004	§ 141.130(b)(2)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
CWSs and NTNCWSs must be operated by qualified personnel who meet the requirements specified by the state and are included in a state register of qualified operators	§ 141.130(c)		
Systems may increase residual disinfectant levels in the distribution system for chlorine or chloramines but not chlorine dioxide to a level and for a time necessary to protect public health to address specific microbiological contamination problems	§ 141.130(d)		
§ 141.131 ANALYTICAL REQUIREMENTS			
System must only use analytical method(s) specified in this section or approved by EPA to demonstrate compliance; methods are effective February 16, 1999	§ 141.131(a)(1)		
Documents containing analytical methods are incorporated by reference	§ 141.131(a)(2)		
Systems must measure DBPs by the methods listed in (b)(1)	§ 141.131(b)(1)		
Analysis for DBPs must be conducted by EPA or state-certified labs; labs must analyze PE samples annually for certification; lab must achieve a 95% confidence interval 80% of the time to remain certified	§ 141.131(b)(2)		
EPA or state approved party must measure daily chlorite samples at the entrance to the distribution system	§ 141.131(b)(3)		
Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine, and chlorine dioxide by the methods listed in (c)(1)	§ 141.131(c)(1)		
System may also measure residual disinfectant concentrations using DPD colorimetric test kits if approved by the state	§ 141.131(c)(2)		
Party approved by EPA or the state must measure residual disinfectant concentrations	§ 141.131(c)(3)		
Systems required to analyze additional parameters must use the specified methods; party approved by the state or EPA must measure the parameters	§ 141.131(d)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Methods for measuring alkalinity	§ 141.131(d)(1)		
Methods for measuring bromide	§ 141.131(d)(2)		
Methods for measuring TOC	§ 141.131(d)(3)		
Methods for measuring SUVA	§ 141.131(d)(4)		
Methods for measuring DOC	§ 141.131(d)(4)(i)		
Methods for measuring UV ₂₅₄	§ 141.131(d)(4)(ii)		
Methods for measuring pH	§ 141.131(d)(5)		
§ 141.132 MONITORING REQUIREMENTS			
Systems must take all samples during normal operating conditions	§ 141.132(a)(1)		
System may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required in (h) with state approval	§ 141.132(a)(2)		
Failure to monitor in accordance with the monitoring plan is a monitoring violation	§ 141.132(a)(3)		
Failure to monitor will be treated as a violation for the entire period covered by an annual average where compliance is based on an annual average of monthly or quarterly samples or averages and a system's failure to monitor makes it impossible to determine MCL/MRDL compliance	§ 141.132(a)(4)		
Systems may use only data collected under the provisions of this subpart or Subpart M to qualify for reduced monitoring	§ 141.132(a)(5)		
Routine monitoring requirements for TTHM and HAA5	§ 141.132(b)(1)(i)		
Reduced monitoring requirements for TTHM and HAA5	§ 141.132(b)(1)(ii)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
System on a reduced monitoring schedule may remain on that schedule as long as annual average of all samples taken in the year or the result of the sample is no more than 0.060mg/L for TTHM and 0.045 mg/L for HAA5; systems that do not meet these levels must resume monitoring at the frequency identified in (b)(1)(i) in the quarter immediately following the monitoring period of the exceedance. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is >0.080 mg/l or the HAA5 annual average is >0.060 mg/L, the system must go to increased monitoring at the frequency identified in (b)(1)(i) in the quarter immediately following the monitoring period of the exceedance.	§ 141.132(b)(1)(iii)		
Systems on increased monitoring may return to routine monitoring if TTHM annual average is ≤0.060 mg/L and HAA5 annual average is ≤0.045 mg/L	§ 141.132(b)(1)(iv)		
State may return a system to routine monitoring at the state's discretion	§ 141.132(b)(1)(v)		
Routine daily monitoring requirements for chlorite	§ 141.132(b)(2)(i)(A)		
Routine monthly monitoring requirements for chlorite	§ 141.132(b)(2)(i)(B)		
Additional monitoring requirements for chlorite	§ 141.132(b)(2)(ii)		
No reduced daily monitoring for chlorite	§ 141.132(b)(2)(iii)(A)		
Reduced monitoring in distribution system for chlorite	§ 141.132(b)(2)(iii)(B)		
Routine monitoring requirements for bromate	§ 141.132(b)(3)(i)		
Reduced monitoring requirements for bromate	§ 141.132(b)(3)(ii)		
Routine monitoring requirements for chlorine and chloramines	§ 141.132(c)(1)(i)		
No reduced monitoring for chlorine and chloramines	§ 141.132(c)(1)(ii)		
Routine monitoring requirements for chlorine dioxide	§ 141.132(c)(2)(i)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Additional monitoring requirements for chlorine dioxide	§ 141.132(c)(2)(iii)		
No reduced monitoring for chlorine dioxide	§ 141.132(c)(2)(iii)		
Routine monitoring requirements for DBP precursors	§ 141.132(d)(1)		
Reduced monitoring requirements for DBP precursors	§ 141.132(d)(2)		
Monitoring requirements for bromide, to remain on reduced bromate monitoring	§ 141.132(e)		
Each system required to monitor must develop and implement a monitoring plan; system must maintain the plan and make it available to the state and the general public no later than 30 days following applicable compliance dates; Subpart H systems serving more than 3,300 must submit a copy of the monitoring plan to the state no later than the date of the first report required under § 141.134; state may require any system to submit its monitoring plan; state may require changes in any plan element	§ 141.132(f)		
Monitoring plan: locations and schedules for collecting samples for any parameters	§ 141.132(f)(1)		
Monitoring plan: how system will calculate compliance with MCL, MRDLs, treatment techniques	§ 141.132(f)(2)		
Monitoring plan: sampling plan must reflect the entire distribution system if approved for monitoring as a consecutive system or if providing water to a consecutive system	§ 141.132(f)(3)		
§141.133 COMPLIANCE REQUIREMENTS			
System fails to monitor that makes it impossible to determine compliance with the MCLs or MRDLs will be treated as a violation for entire period covered by an annual average	§ 141.133(a)(1)		
All samples taken and analyzed under this subpart must be included in determining compliance even if the number is greater than the minimum required	§ 141.133(a)(2)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
If, during the first year of monitoring, any individual quarter's average will cause the annual average of that system to exceed the MCL the system is out of compliance at end of that quarter	§ 141.133(a)(3)		
Compliance requirements for TTHM and HAA5 MCLs for systems monitoring quarterly	§ 141.133(b)(1)(i)		
Compliance requirements for TTHM and HAA5 MCLs for systems monitoring less than quarterly; system must increase monitoring to once per quarter if MCL exceeded	§ 141.133(b)(1)(ii)		
Compliance requirements for TTHM and HAA5 MCLs, if running annual arithmetic average of quarterly averages covering any four-quarter period exceeds the MCL, the system is in violation of the MCL.	§ 141.133(b)(1)(iii)		
Compliance requirements for TTHM and HAA5 MCLs, if a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarters compliance period must be based on an average of the available data.	§ 141.133(b)(1)(iv)		
Compliance requirements for bromate	§ 141.133(b)(2)		
Compliance requirements for chlorite	§ 141.133(b)(3)		
Compliance requirements for chlorine and chloramines: if the MRDL is exceeded the system must notify the public and report to the state	§ 141.133(c)(1)(i)		
Compliance requirements for systems switching between the use of chlorine and chloramines	§ 141.133(c)(1)(ii)		
Compliance requirements for chlorine dioxide acute violations	§ 141.133(c)(2)(i)		
Compliance requirements for chlorine dioxide nonacute violations	§ 141.133(c)(2)(ii)		
Compliance requirements for DBP precursors	§ 141.133(d)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
§ 141.134 REPORTING AND RECORDKEEPING REQUIREMENTS			
Systems required to sample at least quarterly must report to the state within 10 days after the end of each quarter in which samples were collected; systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected	§ 141.134(a)		
Reporting Requirements for DBPs	§ 141.134(b)		
Reporting Requirements for TTHM and HAA5	§ 141.134(b)		
Reporting Requirements for Chlorite	§ 141.134(b)		
Reporting Requirements for Bromate	§ 141.134(b)		
Reporting Requirements for Disinfectants	§ 141.134(c)		
Reporting Requirements for Chlorine and Chloramines	§ 141.134(c)		
Reporting Requirements for Chlorine Dioxide	§ 141.134(c)		
Reporting Requirements for DBP precursors	§ 141.134(d)		
§ 141.135 TREATMENT TECHNIQUE FOR CONTROL OF DBP PRECURSORS			
Subpart H systems using conventional filtration (as defined in §141.2) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in (b) unless the system meets at least one of alternative compliance criteria in (a)(2) or (a)(3)	§ 141.135(a)(1)		
Subpart H systems using conventional filtration treatment may use alternative compliance criteria to comply with this section; systems must still comply with the monitoring requirements in §141.132(d)	§ 141.135(a)(2)		
Alternative compliance criterion: source water running annual average TOC < 2.0 mg/L	§ 141.135(a)(2)(i)		
Alternative compliance criterion: treated water running annual average TOC < 2.0 mg/L	§ 141.135(a)(2)(ii)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Alternative compliance criterion: source water running annual average TOC < 4.0 mg/L; alkalinity > 60 mg/L; TTHM ≤ 0.040 mg/L and HAA5 ≤ 0.030 mg/L or system has made a clear and irrevocable financial commitment to use technologies that will limit the levels of TTHMs and HAA5s	§ 141.135(a)(2)(iii)		
Alternative compliance criterion: running annual average TTHM < 0.040 mg/L and annual average HAA5 < 0.030 mg/L; system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system	§ 141.135(a)(2)(iv)		
Alternative compliance criterion: source water SUVA ≤ 2.0 L/mg-m	§ 141.135(a)(2)(v)		
Alternative compliance criterion: finished water SUVA ≤ 2.0 L/mg-m	§ 141.135(a)(2)(vi)		
Systems practicing enhanced softening that cannot achieve TOC removals in (b)(2) may use alternative compliance criteria; system must still comply with monitoring requirements in § 141.132(d)	§ 141.135(a)(3)		
Alternative compliance criterion: softening that results in lowering treated water running annual average alkalinity to < 60 mg/L (as CaCO ₃)	§ 141.135(a)(3)(i)		
Alternative compliance criterion: softening that results in removing running annual average of at least 10 mg/L magnesium hardness (as CaCO ₃)	§ 141.135(a)(3)(ii)		
Systems must achieve the percent reductions of TOC specified in (b)(2) between the raw water source and CFE unless the state approves a system's request for alternative minimum TOC (Step 2) requirements under (b)(3)	§ 141.135(b)(1)		
Required TOC (Step 1) reductions are based on specified source water parameters; systems that use enhanced softening must meet the percent removal requirements for alkalinity > 120 mg/L for specified source water TOC	§ 141.135(b)(2)		
Subpart H systems that cannot achieve the TOC removals in (b)(2) must apply to state within 3 months of failure to achieve the removals for the approval of alternative minimum TOC removal requirements	§ 141.135(b)(3)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Applications to the state for alternative minimum TOC removals under (b)(3) must include the results of bench- or pilot-scale testing under (b)(4)(i) used to determine an alternate enhanced coagulation level	§ 141.135(b)(4)		
Definition of alternate enhanced coagulation level	§ 141.135(b)(4)(i)		
Requirements for bench- or pilot-scale testing	§ 141.135(b)(4)(ii)		
Requirements for waters with alkalinities < 60 mg/L for which small amounts of alum or equivalent addition of iron coagulant drive the pH below 5.5 before significant TOC removal occurs	§ 141.135(b)(4)(iii)		
System may operate at any coagulant dose of pH necessary (consistent with other NPDWRs) to achieve the minimum TOC percent removal approved in (b)(3)	§ 141.135(b)(4)(iv)		
System may apply to the state for a waiver of enhanced coagulation requirements if water is deemed non-amenable to enhanced coagulation (if the TOC removal is consistently less than 0.3 mg/L of TOC per 10mg/L of incremental alum dose at all dosages of alum, the water is deemed to contain TOC not amenable to enhanced coagulation)	§ 141.135(b)(4)(v)		
Systems must calculate compliance quarterly beginning after the system has collected 12 months of data	§ 141.135(c)(1)		
Determine actual monthly TOC percent removal	§ 141.135(c)(1)(i)		
Determine required monthly TOC percent removal from (b)(2) or (b)(3)	§ 141.135(c)(1)(ii)		
Divide value from (c)(1)(i) by value from (c)(1)(ii)	§ 141.135(c)(1)(iii)		
Add results for (c)(1)(iii) for last 12 months and divide by 12	§ 141.135(c)(1)(iv)		
If value from (c)(1)(iv) < 1.00 the system is not in compliance with the TOC percent removal requirements	§ 141.135(c)(1)(v)		
Systems may use provisions in (c)(2)(i) through (v) in lieu of the calculations in (c)(1)(i) through (v) to determine compliance with TOC percent removal requirements	§ 141.135(c)(2)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
If in any month treated or source water TOC < 2.0 mg/L the system may assign a monthly value of 1.0	§ 141.135(c)(2)(i)		
In any month the system practicing softening removed at least 10 mg/L of magnesium hardness (as CaCO ₃) the system may assign a monthly value of 1.0	§ 141.135(c)(2)(ii)		
In any month source water SUVA prior to treatment ≤ 2.0 L/mg-m the system may assign a monthly value of 1.0	§ 141.135(c)(2)(iii)		
In any month finished water SUVA prior to treatment ≤ 2.0 L/mg-m the system may assign a monthly value of 1.0	§ 141.135(c)(2)(iv)		
In any month a system practicing enhanced softening lowers alkalinity below 60 mg/L (as CaCO ₃) the system may assign a monthly value of 1.0	§ 141.135(c)(2)(v)		
Subpart H systems using conventional treatment may also comply with the requirements of this section by meeting the criteria in (a)(2) or (3)	§ 141.135(c)(3)		
Agency identifies treatment techniques for DBP precursors: enhanced coagulation or enhanced softening	§ 141.135(d)		
SUBPART O—CONSUMER CONFIDENCE REPORTS			
NOTE: If the CCR rule has not been adopted, is it not expected that the Subpart O provision will be adopted with the IESWTR			
§ 141.154 REQUIRED ADDITIONAL HEALTH INFORMATION			
CWSs that detect TTHM above 0.080 mg/L but below the MCL in §141.12 as an annual average monitored and calculated under §141.30 must include health effects language prescribed by paragraph (73) of Appendix C to Subpart O	§ 141.154(e)		

PRIVACY REVISION CROSSWALK FOR THE STAGE 1 DBPR

Federal Requirement	Federal Citation	Explanation of State Policies and Procedures
SUBPART B—PRIMARY ENFORCEMENT RESPONSIBILITY		
§ 142.14 RECORDS KEPT BY STATES		
Records of currently applicable or most recent state determinations; explanation of technical basis for each decision; interim measures toward installation	§ 142.14(d)(12)	
States must keep records of systems installing GAC or membrane technology; date by which system is required to have completed installation	§ 142.14(d)(12)(i)	
State must keep records of systems that are required to meet alternative minimum TOC removal requirements or for whom state has determined that source water is not amenable to enhanced coagulation; alternative limits and rationale for establishing alternative limits	§ 142.14(d)(12)(ii)	
States must keep records of Subpart H systems using conventional treatment meeting any of the alternative compliance criteria in §141.135(a)(2) or (3)	§ 142.14(d)(12)(iii)	
States must keep a register of qualified operators that have met state requirements under §141.16(f)(2)	§ 142.14(d)(12)(iv)	
Records of systems with multiple wells considered to be 1 treatment plant	§ 142.14(d)(13)	
Monitoring plans for Subpart H systems serving more than 3,300 people	§ 142.14(d)(14)	
List of laboratories approved for analyses	§ 142.14(d)(15)	
List of systems required to monitor for disinfectants and DBPs; indicate what disinfectants and DBPs (other than chlorine, TTHM, and HAA5) are measured	§ 142.14(d)(16)	
§ 142.16 SPECIAL PRIVACY REQUIREMENTS		
Requirements for states to adopt 40 CFR part 141, Subpart L (state regs must be at least as stringent)	§ 142.16(h)	
Application must contain description of how state will accomplish program requirements	§ 142.16(h)	
Program requirement: determine any interim treatment requirements for systems electing to install GAC or membranes and are granted additional time to comply with §141.64 (state does not have to respond if it utilizes authority under § 1412(b)(10) to extend schedule)	§ 142.16(h)(1)	

Federal Requirement	Federal Citation	Explanation of State Policies and Procedures
Program requirement: qualify operators of PWSs	§ 142.16(h)(2)	
Program requirement: approve DPD colorimetric test kits for free and total chlorine measurements	§ 142.16(h)(3)	
Program requirement: approve parties to conduct pH, bromide, alkalinity, and residual disinfectant concentration measurements	§ 142.16(h)(4)	
Program requirement: define criteria to use to determine if multiple wells are being drawn from a single aquifer and may be considered a single source for compliance with monitoring requirements.	§ 142.16(h)(5)	
Program requirement: approve alternative TOC (Step 2) removal levels allowed under §141.135(b)	§ 142.16(h)(6)	

Appendix B

Sample Extension Agreement

Under 40 CFR 142.12, states must adopt the requirements of the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) within 2 years of the final rules' publication or by December 16, 2000.

An extension agreement will be necessary **only** when states have not submitted a complete and final primacy revision application package by December 16, 2000. For further detail, please refer to Section III B.

A sample extension agreement is presented on the following pages.

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Extension Agreement

Name of State Agency
U.S. Environmental Protection Agency Region ____
Extension Agreement
for Implementation of the
Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR)

On December 16, 1998, the U.S. Environmental Protection Agency (EPA) published the final Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). This rule amends the National Primary Drinking Water Regulations, 40 CFR Part 141 and the regulations for implementation of the National Primary Drinking Water Regulations, 40 CFR Part 142. Provisions of this rule take effect 36 to 60 months after publication.

The April 28, 1998 revisions to the Primacy Rule extend the time allowed for States to adopt new Federal regulations from 18 months to 2 years. Therefore, the State must adopt regulations pertaining to the Stage 1 DBPR and submit a complete and final primacy revision application by December 16, 2000 unless it requests an extension of up to 2 years to adopt the new or revised regulations.

This document records the terms of a Primacy Extension Agreement between the (Name of State Agency) (the State) and the EPA, Region ____ for the Stage 1 Disinfectants/Disinfection Byproducts Rule, and shall remain effective from the date (for State's eligible for interim primacy) this extension agreement is signed until either December 16, 2002 or the date the State's primacy application is submitted under 40 C.F.R. §142.12. To retain primacy the State must submit a final and approvable Primacy Revision Application incorporating the above-referenced provisions of the Federal Register to EPA, Region ____ by December 16, 2000, or no later than December 16, 2002, if the State has been granted an extension.

Until the State Primacy Revision Application has been submitted, for States eligible for interim primacy, or approved, the State and EPA, Region ____ will share responsibility for implementing the primary program elements as indicated below.

This Extension Agreement outlines the responsibilities of (Name of State Agency) and EPA, Region ____ as partners in this effort, working toward two very specific public health-related goals. The first goal is to achieve a high level of compliance with the regulation. The second goal is to facilitate successful implementation of the regulation during the transition period before the State has interim primacy for the rule. In order to accomplish these goals, education and training will need to be provided to water suppliers on their responsibilities under the Stage 1 DBPR.

Activities to be carried out by the State or Region:

- ☐ Notify PWSs within 60 days of signing this extension agreement of the requirements of the Stage 1 DBPR;
- ☐ Identify other State agencies that should receive copies of the Stage 1 DBPR. Within 60 days of signing this extension agreement, provide EPA Region with the names, addresses, and phone numbers of contacts identified within those agencies;
- ☐ Train State staff and PWSs on the requirements of the Stage 1 DBPR;
- ☐ Devise a tracking system for PWSs' monitoring and reporting performed pursuant to the Stage 1 DBPR;
- ☐ Issue notices to PWSs that fail to meet requirements of the Stage 1 DBPR;
- ☐ Provide copies of the Stage 1 DBPR in response to public inquiries;
- ☐ Report Stage 1 DBPR violation and enforcement information to SDWIS as required;
- ☐ Coordinate with water associations to increase awareness of requirements;
- ☐ Assist with public outreach efforts to inform and educate PWSs;
- ☐ Prepare guidance as needed, or forward national guidance to the States;
- ☐ Keep States informed of SDWIS reporting requirements during development and implementation;
- ☐ Compliance assistance; and,
- ☐ Notify States of all Federal enforcement actions.

This Extension Agreement will take effect upon the date of the last signature.

Dated this _____ day of _____, 2000

Agency Director or Secretary

Name of State Agency

Dated this _____ day of _____, 2000

Regional Administrator
EPA, Region _____

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Appendix C

Statement of Principles—Guidance on Audit Law Issues

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 14 1997

MEMORANDUM

SUBJECT: Statement of Principles
Effect of State Audit Immunity/Privilege Laws
On Enforcement Authority for Federal Programs

TO: Regional Administrators

FROM: Steven A. Herman *SAH*
Assistant Administrator, OECA

Robert Perciasepe *Bob Perciasepe*
Assistant Administrator, OAR

Mary Nichols *Mary Nichols*
Assistant Administrator, OAR

Timothy Fields *Timothy Fields*
Acting Assistant Administrator, OSWER

Under federal law, states must have adequate authority to enforce the requirements of any federal programs they are authorized to administer. Some state audit immunity/privilege laws place restrictions on the ability of states to obtain penalties and injunctive relief for violations of federal program requirements, or to obtain information that may be needed to determine compliance status. This statement of principles reflects EPA's orientation to approving new state programs or program modifications in the face of state audit laws that restrict state enforcement and information gathering authority. While such state laws may raise questions about other federal program requirements, this statement is limited to the question of when enforcement and information gathering authority may be considered adequate for the purpose of approving or delegating programs in states with audit privilege or immunity laws.

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I. Audit Immunity Laws

Federal law and regulation requires states to have authority to obtain injunctive relief, and civil and criminal penalties for any violation of program requirements. In determining whether to authorize or approve a program or program modification in a state with an audit immunity law, EPA must consider whether the state's enforcement authority meets federal program requirements. To maintain such authority while at the same time providing incentives for self-policing in appropriate circumstances, states should rely on policies rather than enact statutory immunities for any violations. However, in determining whether these requirements are met in states with laws pertaining to voluntary auditing, EPA will be particularly concerned, among other factors, with whether the state has the ability to:

- 1) Obtain immediate and complete injunctive relief;
- 2) Recover civil penalties for:
 - i) significant economic benefit;
 - ii) repeat violations and violations of judicial or administrative orders;
 - iii) serious harm;
 - iv) activities that may present imminent & substantial endangerment.
- 3) Obtain criminal fines/sanctions for wilful and knowing violations of federal law, and in addition for violations that result from gross negligence under the Clean Water Act.

The presumption is that each of these authorities must be present at a minimum before the state's enforcement authority may be considered adequate. However, other factors in the statute may eliminate or so narrow the scope of penalty immunity to the point where EPA's concerns are met. For example:

- 1) The immunity provided by the statute may be limited to minor violations and contain other restrictions that sharply limit its applicability to federal programs.
- 2) The statute may include explicit provisions that make it inapplicable to federal programs.

II. Audit Privilege Laws

Adequate civil and criminal enforcement authority means that the state must have the ability to obtain information needed to identify noncompliance and criminal conduct. In

determining whether to authorize or approve a program or program modification in a state with an audit privilege law, EPA expects the state to:

- 1) retain information gathering authority it is required to have under the specific requirements of regulations governing authorized or delegated programs;
- 2) avoid making the privilege applicable to criminal investigations, grand jury proceedings, and prosecutions, or exempt evidence of criminal conduct from the scope of privilege;
- 3) preserve the right of the public to obtain information about noncompliance, report violations and bring enforcement actions for violations of federal environmental law. For example, sanctions for whistleblowers or state laws that prevent citizens from obtaining information about noncompliance to which they are entitled under federal law appear to be inconsistent with this requirement.

III. Applicability of Principles

It is important for EPA to clearly communicate its position to states and to interpret the requirements for enforcement authority consistently. Accordingly, these principles will be applied in reviewing whether enforcement authority is adequate under the following programs:

- 1) National Pollutant Discharge Elimination System (NPDES), Pretreatment and Wetlands programs under the Clean Water Act;
- 2) Public Water Supply Systems and Underground Injection Control programs under the Safe Drinking Water Act;
- 3) Hazardous Waste (Subtitle C) and Underground Storage Tank (Subtitle I) programs under the Resource Conservation Recovery Act;
- 4) Title V, New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants, and New Source Review Programs under the Clean Air Act.

These principles are subject to three important qualifications:

- 1) While these principles will be consistently applied in reviewing state enforcement authority under federal programs, state laws vary in their detail. It will be important to scrutinize the provisions of such statutes closely in determining whether enforcement authority is provided.
- 2) Many provisions of state law may be ambiguous, and it will generally be important to obtain an opinion from the state Attorney General regarding the meaning of the state law.

and the effect of the state's law on its enforcement authority as it is outlined in these principles. Depending on its conclusions, EPA may determine that the Attorney General's opinion is sufficient to establish that the state has the required enforcement authority.

3) These principles are broadly applicable to the requirements for penalty and information gathering authority for each of the programs cited above. To the extent that different or more specific requirements for enforcement authority may be found in federal law or regulations, EPA will take these into account in conducting its review of state programs. In addition, this memorandum does not address other issues that could be raised by state audit laws, such as the scope of public participation or the availability to the public of information within the state's possession.

IV. Next Steps

Regional offices should, in consultation with OECA and national program offices, develop a state-by-state plan to work with states to remedy any problems identified pursuant to application of these principles. As a first step, regions should contact state attorneys general for an opinion regarding the effect of any audit privilege or immunity law on enforcement authority as discussed in these principles.

Appendix D

Stage 1 DBPR Plain English Summary

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The Stage 1 Disinfectants and Disinfection Byproducts Rule

What Does it Mean to You?

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Definitions and Abbreviations

Definitions

Enhanced coagulation ---- the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

Enhanced softening ---- the improved removal of disinfection byproduct precursors by precipitative softening.

Maximum residual disinfectant level (MRDL) ---- a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects.

Maximum residual disinfectant level goal (MRDLG) ---- the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

SUVA ---- Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV 254) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

Total Organic Carbon (TOC) ---- total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

Abbreviations Used in This Document

BAT: Best Available Technology

CDC: Centers for Disease Control and Prevention

CWS: Community Water System

DBP: Disinfection Byproducts

DBPP: Disinfection Byproducts Precursors

EC: Enhanced Coagulation

EPA: United States Environmental Protection Agency

ES: Enhanced Softening

ESWTR: Enhanced Surface Water Treatment Rule

FACA: Federal Advisory Committee Act

FR: Federal Register

GAC10: Granular Activated Carbon with ten minute empty bed contact time and 180 day reactivation frequency

GWR: Ground Water Rule

GWUDI: Ground Water Under the Direct Influence of Surface Water

HAA5: Haloacetic Acids (five)(chloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoacetic acid)

ICR: Information Collection Rule (issued under section 1412(b) of the SDWA)

IESWTR: Interim Enhanced Surface Water Treatment Rule

Log Inactivation: Logarithm of (N_0/N_T)

Log: Logarithm (common, base 10)
LT1ESTWR: Long-Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR: Long-Term 2 Enhanced Surface Water Treatment Rule
MCL: Maximum Contaminant Level
MCLG: Maximum Contaminant Level Goal
M-DBP: Microbial and Disinfectants/Disinfection Byproducts
mg/L: Milligrams per Liter
MR: Monitoring/Reporting
MRDL: Maximum Residual Disinfectant Level
MRDLG: Maximum Residual Disinfectant Level Goal
NIPDWR: National Interim Primary Drinking Water Regulation
NSCEP: National Service for Environmental Publications
NTIS: National Technical Information Service
NTNCWS: Non-Transient Non-Community Water System
PWS: Public Water System
PWSS: Public Water Supply Supervision Program
Reg. Neg.: Regulatory Negotiation
SDWA: Safe Drinking Water Act, or the "Act," as amended 1996
SDWIS: Safe Drinking Water Information System
Subpart H: PWS using surface water or ground water under the direct influence of surface water
SUVA: Specific Ultraviolet Absorbance
SWTR: Surface Water Treatment Rule
TCR: Total Coliform Rule
TNCWS: Transient Non-Community Water Systems
TOC: Total Organic Carbon
TTHM: Total Trihalomethanes (chloroform, bromdichloromethane, dibromochloromethane, and bromoform)

1. Introduction

Purpose of the Guide

The purpose of this guide is to detail the regulatory requirements of the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The Stage 1 DBPR, published in the Federal Register on December 16, 1998 (63 FR 69390; www.epa.gov/OGWDW/mdbp/dbpfr.html; 66 FR 3770; www.epa.gov/safewater/mdbp/iesfr.html), is the first part of a series of rules, the "Microbial-Disinfectants/Disinfection Byproducts Cluster" (M-DBP Cluster), to be published over the next several years that are intended to control microbial pathogens while minimizing the public health risks of disinfectants and disinfection byproducts (DBPs). The Stage 1 DBPR specifically addresses risks associated with disinfectants and DBPs. This rule was published concurrently with the Interim Enhanced Surface Water Treatment Rule (IESWTR), which addresses control of microbial pathogens.

Background

The 1974 Safe Drinking Water Act (SDWA) called for EPA to regulate drinking water by creating the national interim primary drinking water regulations (NPDWR). In 1979, the first interim standard addressing DBPs was set for total trihalomethanes (TTHMs), a group of four volatile organic chemicals which form when disinfectants react with natural organic matter in the water.

Although SDWA was amended slightly in 1977, 1979, and 1980, the most significant changes to the 1974 law occurred when SDWA was reauthorized in 1986. Disease-causing microbial contamination had not been sufficiently controlled under the original Act. To safeguard public health, the 1986 Amendments required EPA to set health goals, or maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for 83 named contaminants. EPA was also required to establish regulations within certain time frames, require disinfection of all public water supplies, specify filtration requirements for nearly all water systems that draw their water from surface sources, and develop additional programs to protect ground water supplies.

In 1989, EPA issued two important National Primary Drinking Water Regulations (NPDWR): The Total Coliform Rule (TCR) and the Surface Water Treatment Rule (SWTR). The TCR and SWTR provide the foundation for the M-DBP Cluster and are summarized below.

The TCR covers all public water systems. Since coliforms are easily detected in water, they are used to indicate a water system's vulnerability to pathogens in the water. In the TCR, EPA set a MCLG of zero for total coliforms. EPA also set a MCL for total coliforms. If more than 5.0 percent of the samples contain coliforms within a month, water system operators must report this violation to the state and the public. In addition, sanitary surveys are required every five or ten years (depending on the quality of the source water) for every system that collects fewer than five samples per month (typically systems that serve less than 4,100 people).

EPA issued the SWTR in response to Congress' mandate requiring disinfection, and where necessary, filtration of systems that draw their water from surface sources before distribution. The SWTR applies to all systems that use surface water or ground water under the direct influence of surface water (GWUDI). The rule sets MCLGs for *Legionella*, *Giardia lamblia*, and viruses at zero since any exposure to these contaminants presents some level of health risk.

Specifically, the rule requires that a surface water system have sufficient treatment to reduce the source water concentration of *Giardia lamblia* and viruses by at least 99.9 percent (3 log) and 99.99 percent (4 log), respectively. A detectable disinfection residual must be maintained throughout the entire distribution system. For systems that filter, the adequacy of the filtration process is determined by measuring the turbidity of the treated water since high levels of turbidity often indicate that the filtration process is not working properly. The goal of the SWTR is to reduce risk to less than one infection per

year per 10,000 people. However, the SWTR does not account for systems with high pathogen concentrations that, when treated at the levels required under the rule, still may not meet this health goal, and the rule does not specifically control for the protozoan *Cryptosporidium*.

In 1990, EPA's Science Advisory Board, an independent panel of experts established by Congress, cited drinking water contamination as one of the most important environmental risks and indicated that disease-causing microbial contaminants (*i.e.*, bacteria, protozoa, and viruses) are probably the greatest remaining health-risk management challenge for drinking water suppliers. Data from the Centers for Disease Control (CDC) confirm this concern and indicate that between 1980 and 1994, 379 waterborne disease outbreaks were reported, with over 500,000 cases of disease. During this period, a number of agents were implicated as the cause, including protozoa, viruses, bacteria, and several chemicals. Most of the cases (but not the outbreaks) were associated with surface water, including a single outbreak of cryptosporidiosis in Milwaukee (over 400,000 cases).

In response to these findings, the SDWA was further amended in 1996 to improve public health protection by incorporating new data on the adverse health effects of contaminants, the occurrence of contaminants in public water systems, and the estimated reduction in health risks that would result from further regulation. The Act also increased scientific research requirements and emphasized cost-benefit analyses in the regulatory decision process.

Based on prevailing scientific data, the M-DBP Cluster is intended to control microbial pathogens while minimizing the public health risk from disinfectants and DBPs. Since multiple threats require multiple barriers, the IESWTR and Stage 1 DBPR expand on the foundation of the TCR, SWTR, and TTHM standards to target health risk outliers unaddressed by prior regulations.

The TTHM NPDWR of 1979 set a standard for TTHMs only for public water systems (PWSs) serving 10,000 or more people. The Stage 1 DBPR builds on the TTHM Rule by lowering the MCL and widening the range of affected systems to include all PWSs that add a disinfectant. Therefore, EPA believes that the promulgation of the Stage 1 DBPR will significantly decrease the risks posed by DBPs and disinfectants by covering many PWSs not currently regulated for TTHM or other DBPs.

Many water systems treat their water with a chemical disinfectant in order to inactivate pathogens that cause disease. The public health benefits of common disinfection practices are significant and well-recognized; however, disinfection poses risks of its own. While disinfectants are effective in controlling many harmful microorganisms, they react with organic and inorganic matter (disinfection byproduct precursors—DBPPs) in the water and form DBPs, some of which pose health risks at certain levels. Since the discovery of chlorination byproducts in drinking water in 1974, numerous toxicological studies have been conducted that show some DBPs to be carcinogenic and/or cause reproductive or developmental effects in laboratory animals. Additionally, exposure to high levels of disinfectants over long periods of time may cause health problems, including damage to blood and kidneys. While many of these studies have been conducted at high doses, the weight-of-evidence indicates that DBPs present a potential public health problem that must be addressed. One of the most complex questions facing water supply professionals is how to reduce risks from disinfectants and DBPs while providing increased protection against microbial contaminants. Much of the population is exposed to these risks; therefore, a substantial concern exists.

To address this concern, the Stage 1 DBP Rule updates and supersedes the 1979 TTHM standard by lowering the MCL for TTHMs and establishing maximum residual disinfection level (MRDL) limits for chlorine, chloramines, and chlorine dioxide and new MCLs for chlorite, bromate, and haloacetic acids (HAA5) for all community water systems and nontransient noncommunity water systems that add a chemical disinfectant for either primary or residual treatment. In addition, the Stage 1 DBP Rule requires conventional filtration systems to remove specified percentages of organic materials measured as total organic carbon (TOC) that may react with disinfectants to form DBPs.

By building on the foundation set forth by the original SDWA, the quality of drinking water has improved and public health protection has increased. The IESWTR and Stage 1 DBP Rules are part of a series of rules designed to expand on the foundation of prior rulemaking efforts. By encompassing previously unaddressed health risks from microbials and disinfection byproducts, the M-DBP Cluster continues to maximize drinking water quality and public health protection.

Development of the Rule

The new rules are a product of 6 years of collaboration among the water supply industry, environmental and public health groups, and local, state, and federal governments. EPA first launched a rule-making process in 1992 and convened a Regulatory Negotiation (RegNeg) Advisory Committee under the Federal Advisory Committee Act (FACA), representing a range of stakeholders affected by possible regulation. The 1996 SDWA Amendments required EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts.

In 1997, a similar FACA process was implemented with the Microbial-Disinfectants/Disinfection Byproducts (M-DBP) Advisory Committee. The M-DBP Committee convened to collect, share, and analyze new information available since 1994, review previous assumptions made during the RegNeg process, as well as build consensus on the regulatory implications of this new information. Negotiations resulted in the following three proposals:

- A staged approach to regulation of DBPs (referred to as the Stage 1 and Stage 2 DBPRs) incorporating Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs), and treatment technique requirements;
- A companion Interim Enhanced Surface Water Treatment Rule (IESWTR) designed to improve control of microbial pathogens and prevent inadvertent reductions in microbial safety as a result of DBP control efforts; and,
- An Information Collection Rule (ICR) to collect information necessary to reduce many key uncertainties prior to subsequent negotiations for the Stage 2 DBPR.

Benefits of the Rule

The Stage 1 DBPR is expected to reduce the risks associated with exposure to disinfectants and DBPs. The MCLs will reduce exposure to specific DBPs from the use of ozone (byproduct: bromate), chlorine dioxide (byproduct: chlorite), and chlorine (byproducts: TTHM and five Haloacetic Acids—HAA5)). In addition, the implementation of a treatment technique (enhanced coagulation/ enhanced softening) will reduce overall exposure to the broad range of non-specified DBPs. In the Regulatory Impact Analysis for the Stage 1 DBPR, EPA estimated that the rule will result in a national annual average reduction in TTHM levels of 24 percent. As many as 140 million people will have increased protection from DBPs and their potential health risks, including bladder cancer and adverse developmental and reproductive health effects.

2. Applicability and Compliance Dates

The 1979 Total Trihalomethane (TTHM) Rule requirements apply only to systems serving 10,000 or more people. The Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR) covers a larger number of PWSs, applying to *all* community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) *which add a chemical disinfectant to the water in any part of the drinking water treatment process*. In addition, certain requirements apply to transient noncommunity water systems (TNCWSs) that use chlorine dioxide.

Subpart H systems (PWSs that use that use surface water or ground water under the direct influence of surface water—GWUDI—as a source) serving 10,000 or more people must comply with the requirements of the Stage 1 DBPR no later than January 2002. Subpart H systems that serve fewer than 10,000 people, and all affected ground water systems, must comply with the requirements no later than January 2004.

The timetable for the Stage 1 DBPR is presented in Table 1. The Stage 1 DBPR and the IESWTR were published simultaneously to address the inherent tradeoffs between protection from microbial contamination and the potential health effects from disinfectants and their byproducts. These rules are the first in a series of rules that will continue to address the public health concerns associated with microbial pathogens and chemical disinfectants.

Table 1: Timetable for the Stage 1 DBPR Requirements

Date	DBPR Requirement
December 16, 1998	Rule is published in Federal Register [63 FR 241 69390].
February 16, 1999	60-day legal challenge period ends.
February 16, 1999	Methods specified in 40 CFR 141.131 for analyzing disinfection byproducts, disinfection residuals, and DBP precursors are approved for use [40 CFR 141.131(a)].
January 1, 2001	Large Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2002	Large Subpart H TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65(b)(2)].
January 1, 2002	Requirements of Subpart L generally apply to large Subpart H CWSs and NTNCWs [40 CFR 141.130(b)(1)]. <ul style="list-style-type: none"> • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
January 1, 2003	Small Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
December 31, 2003	Systems which received an extension from the state to install GAC or membranes must comply with the Stage 1 DBPR [40 CFR 141.64(b)(2)].
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2004	Small Subpart H and all ground water TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65 (b)(2)].

Date	DBPR Requirement
January 1, 2004	Requirements of Subpart L generally apply to small Subpart H and all ground water CWSs and NTNCWs [40 CFR 141.130(b)(1)]. <ul style="list-style-type: none"> • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
June 30, 2005	Systems that made a clear and irrevocable financial commitment before the applicable compliance date to install technologies that limit TTHM and HAA5 to 0.040 mg/L and 0.030 mg/L, respectively, must have these technologies installed and operating. [40 CFR 141.135(a)(2)(iii)].

3. Summary of regulatory requirements

MCLGs and MCLs for disinfection byproducts

The Stage 1 DBPR sets maximum contaminant level goals (MCLGs) for some of the regulated DBPs, a more stringent maximum contaminant level (MCL) for TTHM, and new MCLs for HAA5, bromate, and chlorite. MCLGs are set at concentrations at which no known or anticipated adverse health effects are expected to occur. They are non-enforceable public health goals. MCLs are enforceable contaminant standards that are feasible to achieve and measure.

These MCLs, along with the MRDLs and treatment technique explained in the following paragraphs, will help reduce exposure to DBPs and disinfectants and their associated health risks.

Disinfection Byproduct	MCLG (mg/L)	MCL (mg/L)
Total Trihalomethanes (TTHM)		0.080
Chloroform		
Bromodichloromethane	zero	
Bromoform	zero	
Dibromochloromethane	0.06	
Five Haloacetic Acids (HAA5)		0.060
Monochloroacetic Acid		
Dichloroacetic Acid	zero	
Trichloroacetic Acid	0.3	
Monobromoacetic Acid		
Dibromoacetic Acid		
Chlorite	0.8	1.0
Bromate	zero	0.010

Compliance for TTHM and HAA5 MCLs is based on a running annual arithmetic average, computed quarterly, of quarterly averages of all samples. Compliance for the chlorite MCL is based on an arithmetic average of each three sample set taken in the distribution system. Compliance for the bromate MCL is based on a running annual arithmetic average, computed quarterly, of monthly samples.

MRDLGs and MRDLs for disinfectant residuals

To protect against potential health risks caused by high levels of residual disinfectants, the Stage 1 DBPR sets the following maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs). Like MCLGs and MCLs, respectively, MRDLGs are non-enforceable, while MRDLs are enforceable.

Disinfectant	MRDLG (mg/L)	MRDL (mg/L)
Chlorine	4 (as Cl ₂)	4.0 (as Cl ₂)
Chloramines	4 (as Cl ₂)	4.0 (as Cl ₂)
Chlorine Dioxide	0.8	0.8

Systems using chlorine or chloramines may temporarily increase residual disinfectant levels to an appropriate level protect to public health in order to address specific microbiological contamination problems. These problems may be caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events. This option is NOT available for the use of chlorine dioxide.

Compliance for chlorine and chloramine MRDLs is based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples. Compliance for the chlorine dioxide MRDL is based on consecutive daily samples.

Treatment technique for disinfection byproduct precursors

The rule includes a treatment technique that applies to Subpart H systems using conventional filtration treatment. The treatment technique was established because disinfectants can react with disinfection byproduct precursors (DBPPs) to form both regulated and non-regulated DBPs. The treatment technique requirements in the rule are designed to provide public health protection by minimizing the production of all DBPs. Compliance with the treatment technique can be achieved by removing specified percentages of Total Organic Carbon (TOC) using enhanced coagulation or enhanced softening. Alternatively, systems may comply by showing they meet alternative compliance criteria. For example, systems which have a low level of TOC in their source or treated water (less than 2.0 mg/L) meet alternative compliance criteria.

Best available technology (BAT)

EPA has specified the Best Available Technology (BAT) for each MCL and MRDL established in the rule. These technologies and methods are believed to be effective in controlling chemicals in drinking water while remaining economically feasible for PWSs to employ. PWSs must use the specified BAT if they wish to qualify for variances. Otherwise, systems are not required to install BAT and may use any technology to achieve compliance.

Chemical		Best Available Technology
DBPs	TTHM and HAA5	Enhanced coagulation or granular activated carbon (GAC 10), with chlorine as the primary and residual disinfectant
	Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels
	Bromate	Control of ozone treatment process to reduce production of bromate
Disinfectants	Chlorine, chloramine, and chlorine dioxide	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

Public water system recordkeeping and reporting requirements

For each disinfectant, contaminant, contaminant group, and treatment technique, EPA has developed routine compliance monitoring schemes to be protective of acute and chronic health concerns. The compliance monitoring requirements vary by the size and type of system, the treatment employed, and the disinfectant used. In many cases, systems may reduce monitoring frequencies after establishing a baseline.

Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which the samples were collected. Those required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. Systems that are required to conduct additional monitoring because of the disinfectant used (e.g., chlorine dioxide) are subject to additional reporting requirements if certain chemical levels are measured.

Laboratory methods and certification

The rule specifies analytical methods for measuring each relevant water quality parameter, disinfectant, contaminant, and DBPP. Consistent with current regulations, only certified laboratories can analyze samples for compliance with the MCLs. However, chlorite measured at the entrance to the distribution systems is a trigger, not an MCL compliance sample, and may be analyzed by a party approved by the state. For disinfectants and other specified parameters that EPA believes can be adequately measured by other than certified laboratories, and for which there is good reason to allow on-site analysis (e.g., for samples that may deteriorate before reaching a certified laboratory), EPA is requiring that analyses be conducted by a party approved by the state.

4. Additional information

A series of guidance manuals have been developed to support the Interim Enhanced Surface Water Treatment Rule and the Stage 1 Disinfectants/Disinfection Byproducts Rule. The manuals will aid EPA, state agencies and affected public water systems in implementing the two interrelated rules, and will help to ensure that implementation among these groups is consistent. The manuals are available on EPA's website at www.epa.gov/safewater/mdbp/implement.html. Additional information on ordering these manuals is provided below.

Guidance Manual for Enhanced Coagulation and Enhanced Precipitative Softening (EPA 815-R-99-012)

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 Disinfectants and Disinfection Byproducts Rule and to provide guidance to state staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement; explains how to set an alternative TOC removal percentage under the Step 2 procedure; details monitoring, reporting, and compliance requirements; and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Alternative Disinfectants and Oxidants Guidance Manual (EPA 815-R-99-014)

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine, so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant(s) is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment and operator skill). The manual also contains a summary of existing alternative disinfectants used in the United states and cost estimates for the use of alternative disinfectants.

M/DBP Simultaneous Compliance Manual (EPA 815-R-99-015)

Objective: To assist public water systems on complying simultaneously with various drinking water regulations (e.g., Stage 1 Disinfectants and Disinfection Byproducts Rule, Interim Enhanced Surface Water Treatment Rule, Lead and Copper Rule and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rules.

Contents: The manual provides detailed information on the requirements in the Stage 1 Disinfectants and Disinfection Byproducts Rule and the Interim Enhanced Surface Water Treatment Rule.

To order copies of these guidance manuals you may contact the Safe Drinking Water Hotline at (800) 426-4791 or you may download an electronic version from the OGWDW website at:

www.epa.gov/safewater/mdbp/implement.html

Guidance manuals are also available through the National Service Center for Environmental Publications (NSCEP) (free of charge). These documents may also be purchased through National Technical Information Service (NTIS)

NSCEP: 1.800.490.9198

NTIS: 1.800.553.6847

5. Detailed regulatory requirements

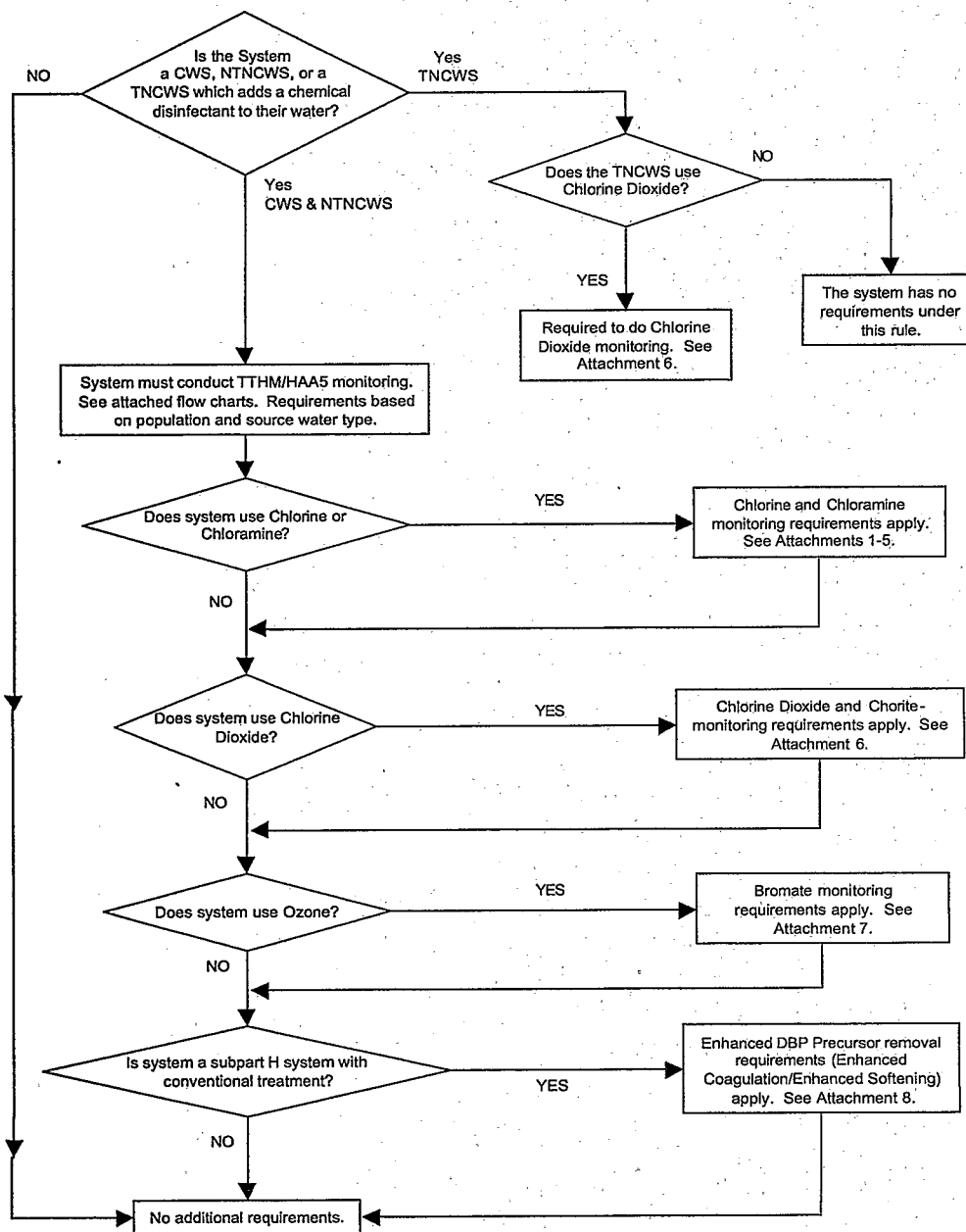
Detailed descriptions of the monitoring and reporting requirements for public water systems (PWSs) are presented in the following section. The Stage 1 DBPR applies to all community water systems and nontransient noncommunity water systems that add a chemical disinfectant or oxidant, as well as transient noncommunity water systems that treat their water with chlorine dioxide. However, systems will monitor at various frequencies depending on type (Subpart H and ground water) and size. Additionally, the type of chemical monitored will also vary depending on system type and the primary disinfectant used. For this reason, tables that outline the monitoring and reporting requirements are presented for each system size and type.

This section is organized so that specific categories of systems can turn right to where their specific requirements are. Keep in mind that some systems may fall into more than one category listed below. The categories of systems are:

- Subpart H systems serving at least 10,000 people (Attachment 1)
- Subpart H systems serving 500-9,999 people (Attachment 2)
- Subpart H systems serving fewer than 500 people (Attachment 3)
- Ground water systems serving at least 10,000 people (Attachment 4)
- Ground water systems serving fewer than 10,000 people (Attachment 5)
- Systems using chlorine dioxide (Attachment 6)
- Systems using ozone (Attachment 7)
- Subpart H systems using conventional filtration treatment (Attachment 8)

Systems should review all the attachments which apply to them to gain a full understanding of how the Stage 1 DBPR will affect them. For example, a surface water system serving 7,000 people using conventional filtration and chlorine dioxide as an oxidant should review Attachments 2, 6, and 8.

Stage 1 DPBR General Requirements



I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

You must conduct the monitoring, compliance determinations, reporting, and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet any of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.
- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.
- You operate a treatment plant that uses conventional filtration treatment. Additional requirements are found in Attachment 8.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be submitted to the state.

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	4 samples per plant per quarter	At least 25% of samples must be at locations representing maximum residence time. Remaining samples must represent average residence time and the entire distribution system (account for number of people served, different sources of water, different treatment methods).
Chlorine and Chloramines	Same time as total coliform samples are taken	Same locations as total coliform samples are taken.

Notes:

1. If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per quarter	In the distribution system at a location representing maximum residence time.	<ul style="list-style-type: none"> • Source water annual average TOC before any treatment ≤ 4.0 mg/L and • Annual average TTHM ≤ 0.040 mg/L and • Annual average HAA5 ≤ 0.030 mg/L
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the MCLs and MRDLs in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	<p>Running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected.</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must revert to routine monitoring immediately.
Chlorine and Chloramines	<p>Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.
3. If during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

What do I have to REPORT to the State under the Stage 1 DBPR?

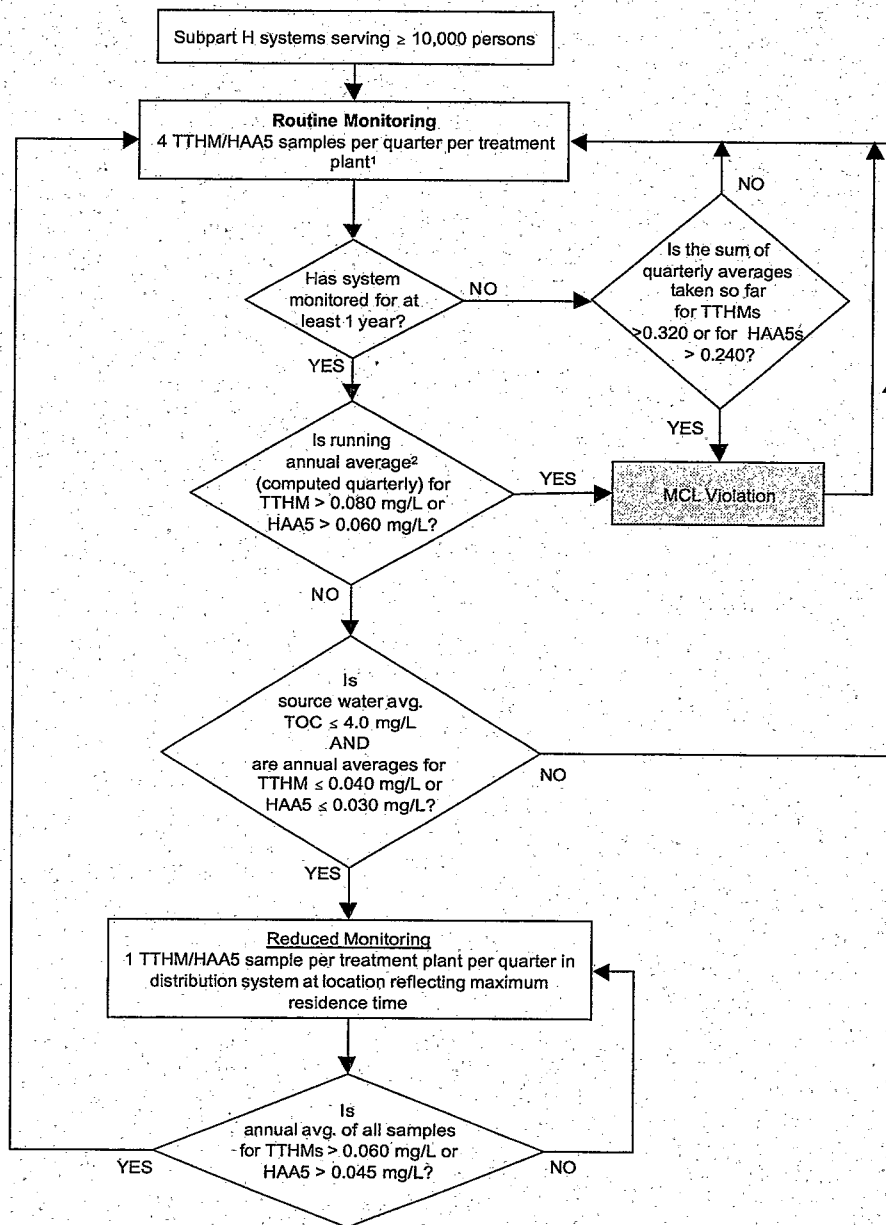
Chemical	What must be reported
TTHM and HAA5	<p>If conducting routine or reduced monitoring:</p> <ul style="list-style-type: none"> • Number of samples taken during last quarter • Location, date, result of each sample taken during last quarter • Arithmetic average of all samples taken in last quarter • Annual arithmetic average of quarterly averages for last 4 quarters • Whether MCL was exceeded (Report violation of the MCL)
Chlorine and Chloramines	<ul style="list-style-type: none"> • Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded (Report violation of MRDL)

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

TTHMs & HAA5 Monitoring Requirements for Subpart H Systems Serving $\geq 10,000$ Persons

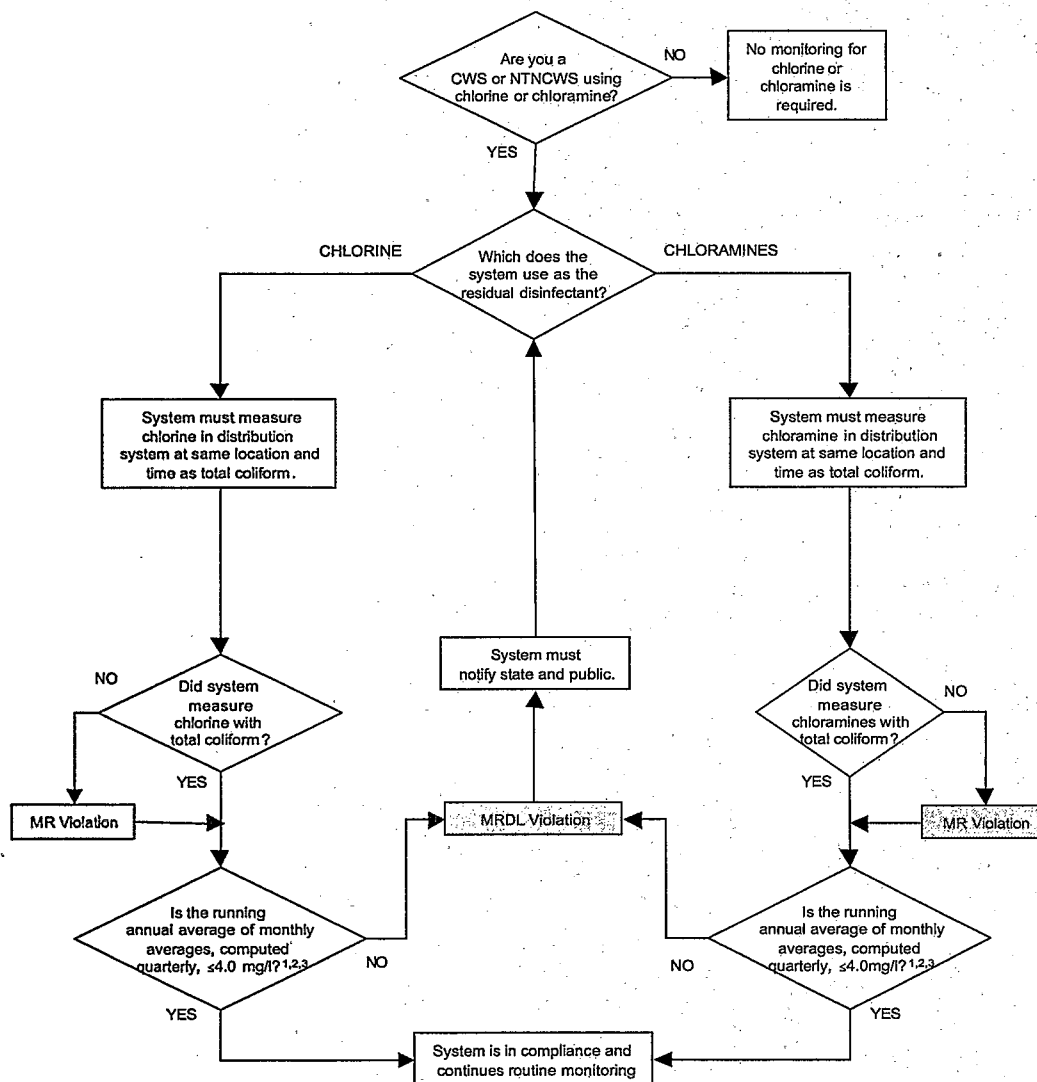


NOTES

¹ 3 samples reflect average residence time and 1 sample reflects maximum residence time (at least 25% of samples must reflect maximum residence time).

² If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.

Monitoring Requirements for Chlorine and Chloramine



NOTES

1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

*I operate a surface water system or ground water system
under the direct influence of surface water that serves
500 to 9,999 people . . .*

(Attachment 2) I operate a surface water system or ground water system under the direct influence of surface water that serves 500 to 9,999 people . . .

You must conduct the monitoring, compliance determinations, reporting , and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.
- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.
- You operate a treatment plant that uses conventional filtration treatment. Additional requirements are found in Attachment 8.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. For systems serving more than 3,300 people the monitoring plan must be submitted to the state.

(Attachment 2) I operate a surface water system or ground water system under the direct influence of surface water that serves 500 to 9,999 people . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	One sample per plant per quarter	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES

1. If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the entire distribution system (account for number of people served, different sources of water, different treatment methods)

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per year during month of warmest temperature	In the distribution system at a location representing maximum residence time.	<ul style="list-style-type: none"> • Source water annual average TOC before any treatment ≤ 4.0 mg/L and • Annual average TTHM ≤ 0.040 mg/L and • Annual average HAA5 ≤ 0.030 mg/L
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 2) I operate a surface water system or ground water system under the direct influence of surface water that serves 500 to 9,999 people . . .

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the MCLs and MRDLs in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	<p>Running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected (routine monitoring).</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must revert to routine monitoring immediately.
Chlorine and Chloramines	<p>Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.
3. If during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

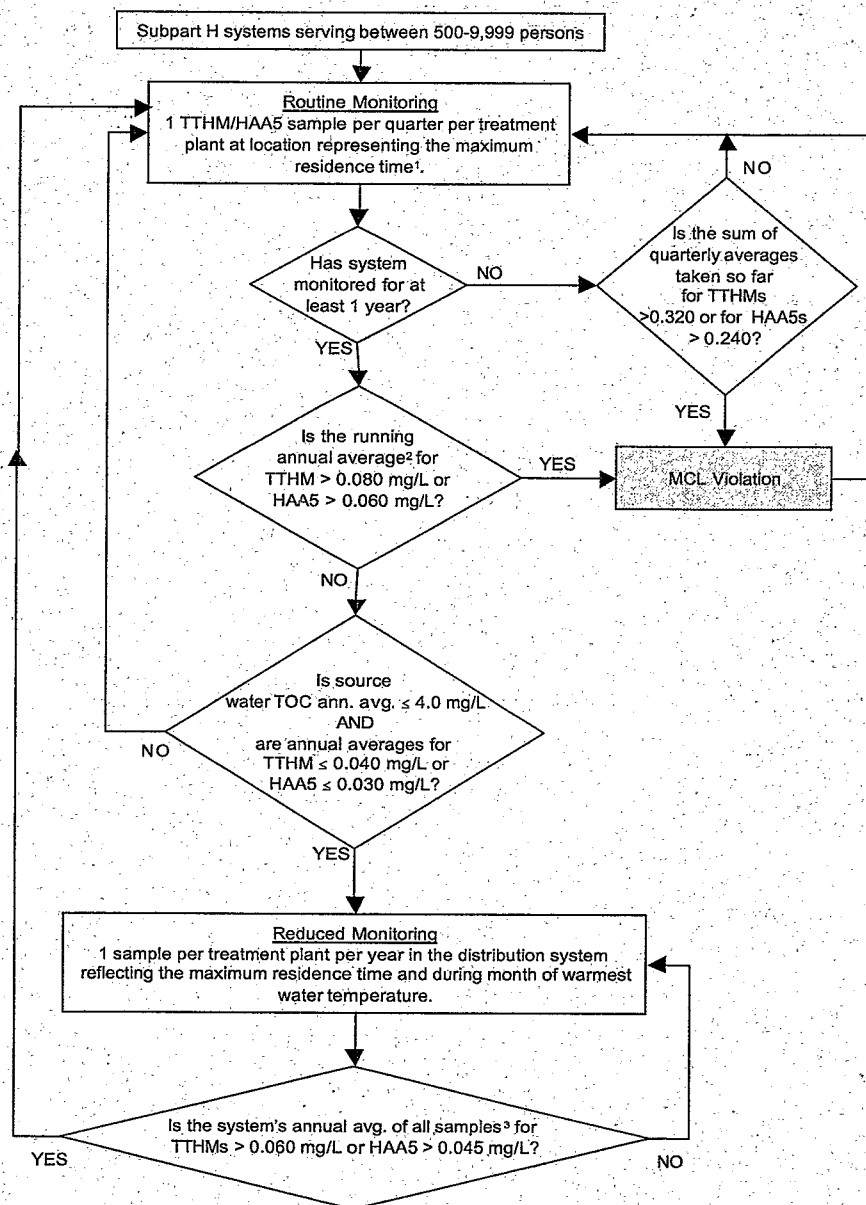
What do I have to REPORT to the State under the Stage 1 DBPR?

Chemical	What must be reported
TTHM and HAA5	<ul style="list-style-type: none"> • Number of samples taken during last quarter (routine monitoring) • Location, date, result of each sample taken during last quarter • Arithmetic average of all samples taken in last quarter • Annual arithmetic average of quarterly averages for last 4 quarters • Whether MCL was exceeded <p><i>If conducting reduced monitoring:</i></p> <ul style="list-style-type: none"> • Number of samples taken during last year • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded
Chlorine and Chloramines	<ul style="list-style-type: none"> • Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

TTHM & HAA5 Monitoring for Subpart H Systems Serving Between 500-9,999 Persons



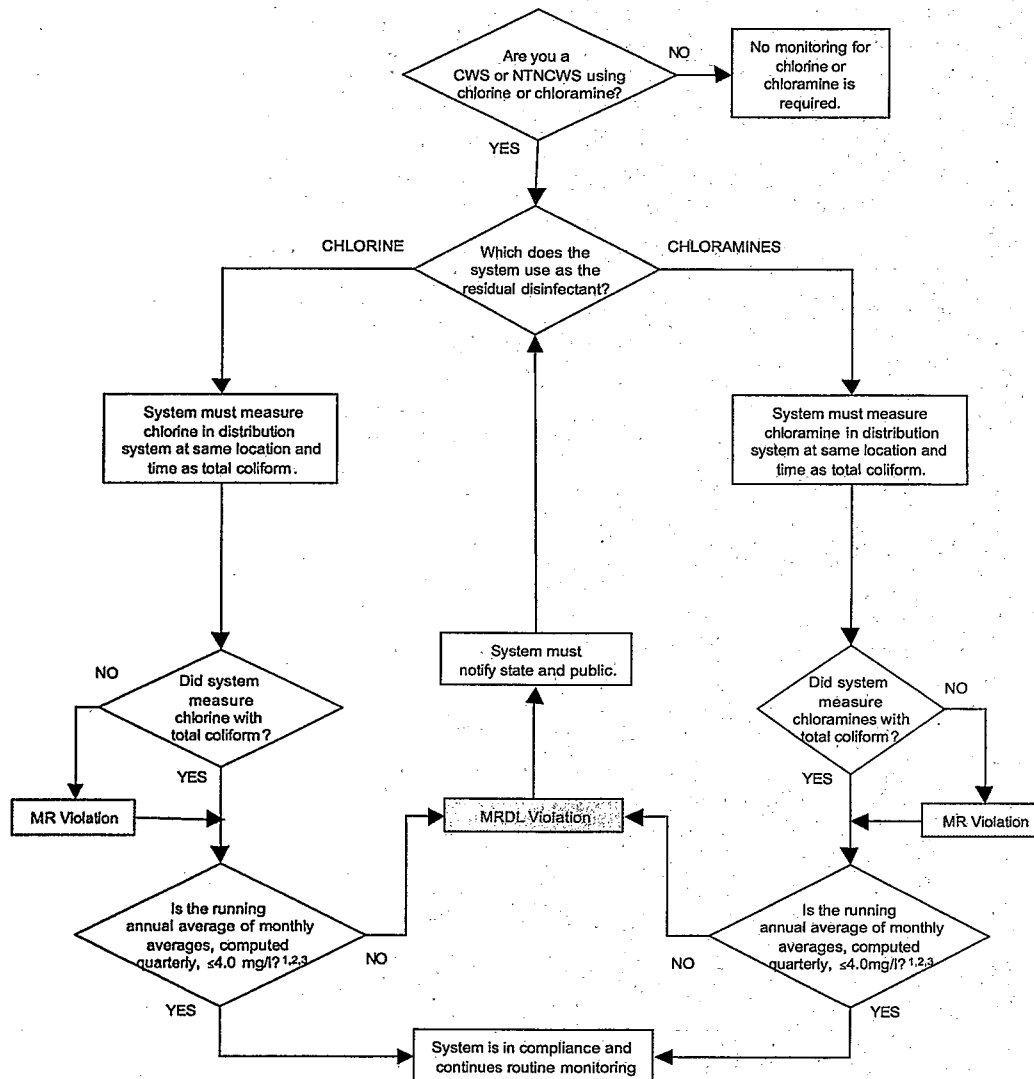
NOTES

¹ If more than 1 sample, at least 25% of samples must reflect max residence time.

² If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.

³ Average of all samples taken in the year or the result of the sample for systems which must monitor no more frequently than annually.

Monitoring Requirements for Chlorine and Chloramine



NOTES

1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

*I operate a surface water system or ground water system
under the direct influence of surface water that serves
fewer than 500 people . . .*

(Attachment 3) I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

You must conduct the monitoring, compliance determinations, reporting, and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.
- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.
- You operate a treatment plant that uses conventional filtration treatment. Additional requirements are found in Attachment 8.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be kept on hand and readily available to the state and public.

(Attachment 3) I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	<ul style="list-style-type: none">One sample per plant per year during month of warmest water temperature - if MCL is exceeded in yearly sample, system goes to increased monitoring of 1 sample per plant per quarter	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES

1. The system may revert to annual monitoring if the annual average is $\leq 40/30$ based on at least four quarters of monitoring.
2. If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	No reduced monitoring	NA	NA
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 3) I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the MCLs and MRDLs in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	<p>Average of samples taken in the year.</p> <ul style="list-style-type: none">• If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant. Compliance will be based on 4 quarters of monitoring.• The system must notify the public and report to the state if in violation.• If an annual average exceeds the MCL and the system is on reduced monitoring, it must go to increased monitoring immediately. If a system on increased monitoring exceeds the MCL, it is in violation.
Chlorine and Chloramines	<p>Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.</p> <ul style="list-style-type: none">• If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation.• The system must notify the public and report to the state if in violation.• If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.
3. If during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

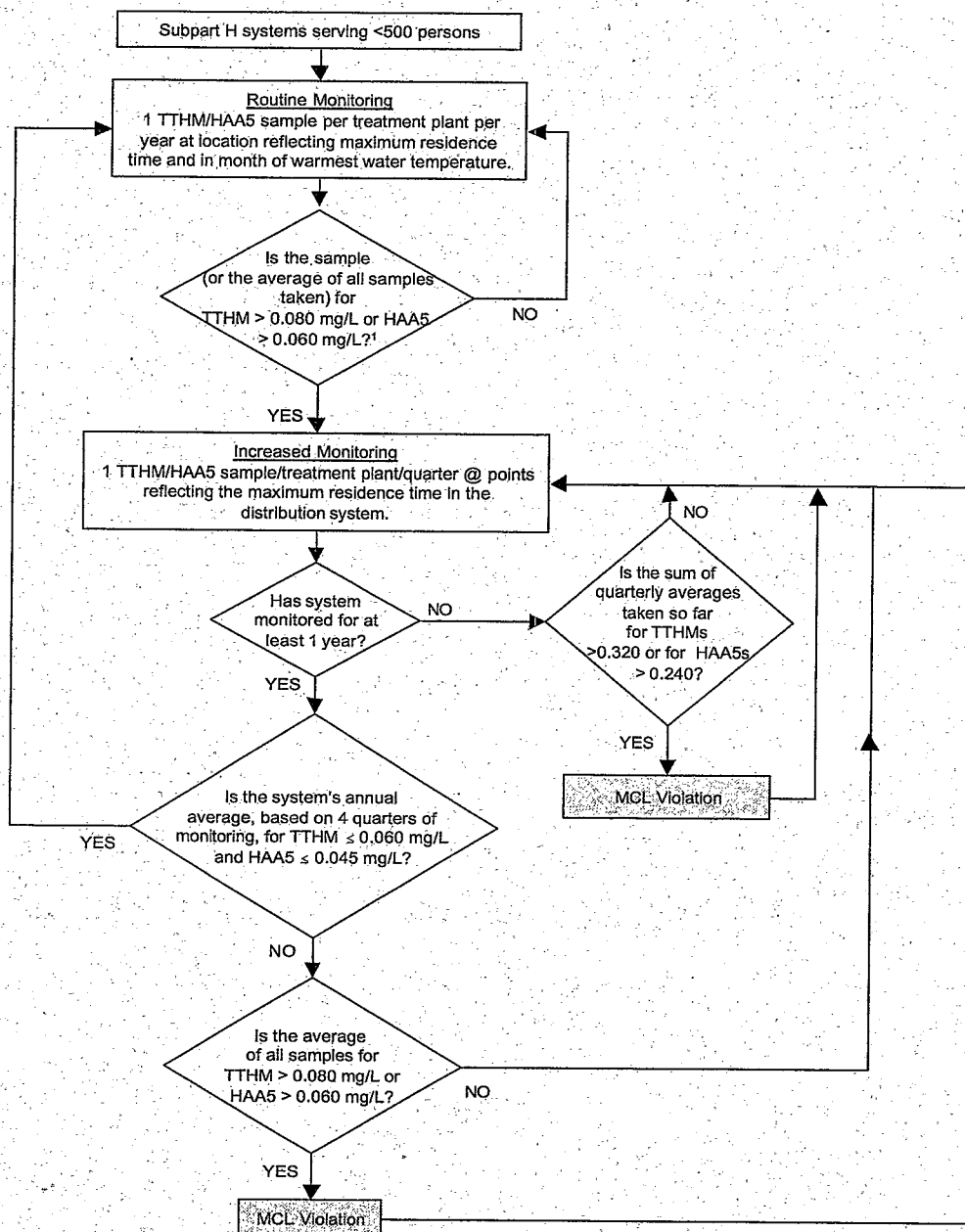
What do I have to REPORT to the State under the Stage 1 DBPR?

Chemical	What must be reported
TTHM and HAA5	<ul style="list-style-type: none">• Number of samples taken during last year (or in last quarter if on increased monitoring)• Location, date, result of each sample taken during last year• Arithmetic average of all samples taken over last year• Whether MCL was exceeded
Chlorine and Chloramines	<ul style="list-style-type: none">• Number of samples taken during each month of last quarter• Monthly arithmetic average of all samples taken in each month• Arithmetic average of all monthly averages for last 12 months• Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

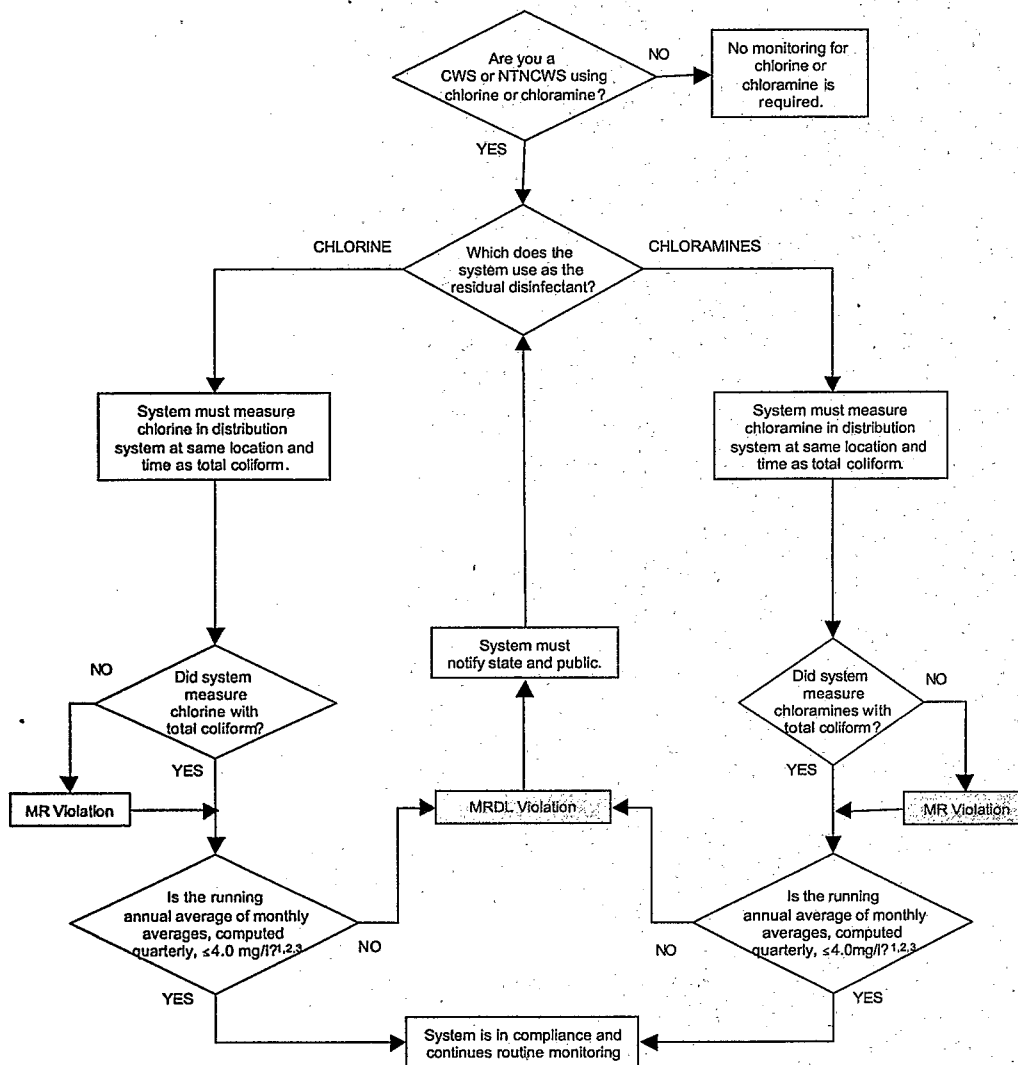
TTHM & HAA5 Monitoring for Subpart H Systems Serving <500 Persons



NOTES

1) If a system elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

Monitoring Requirements for Chlorine and Chloramine



NOTES

1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

(Attachment 4) I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

You must conduct the monitoring, compliance determinations, reporting , and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.
- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs and MRDLs, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be kept for review by the state and public.

(Attachment 4) I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	One sample per plant per quarter	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES:

1. Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with state approval.
2. If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per year during month of warmest water temperature	Location representative of maximum residence time	<ul style="list-style-type: none"> • Annual average TTHM \leq 0.040 mg/L and • Annual average HAA5 \leq 0.030 mg/L
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 4) I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the MCLs and MRDLs of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	<p>Running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected.</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must revert to routine monitoring immediately.
Chlorine and Chloramines	<p>Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.
3. If during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

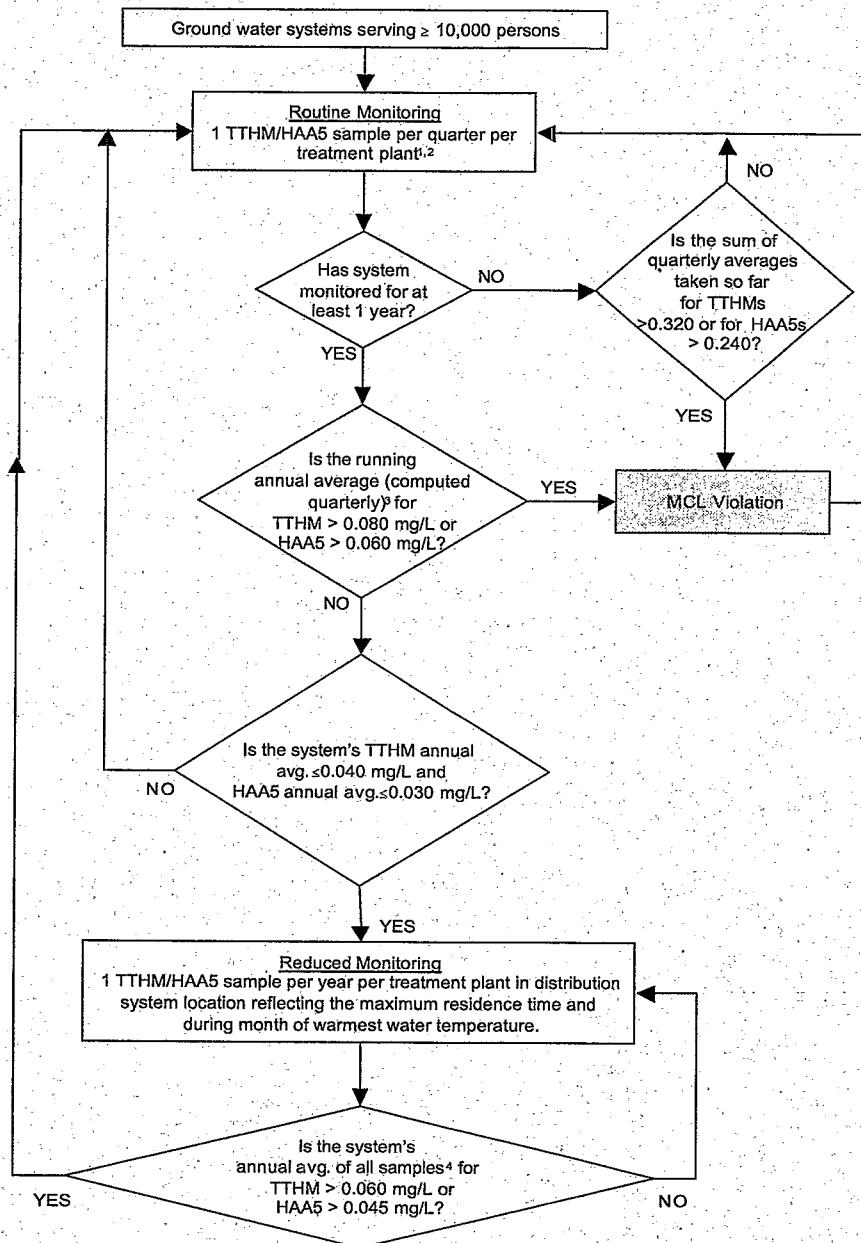
What do I have to REPORT to the State under the Stage 1 DBPR?

Chemical	What must be reported
TTHM and HAA5	<ul style="list-style-type: none"> • Number of samples taken during last quarter • Location, date, result of each sample taken during last quarter • Arithmetic average of all samples taken during last quarter • Annual arithmetic average of quarterly arithmetic average for last 4 quarters • Whether MCL was exceeded <p><i>If conducting reduced monitoring:</i></p> <ul style="list-style-type: none"> • Number of samples taken during last year • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded
Chlorine and Chloramines	<ul style="list-style-type: none"> • Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

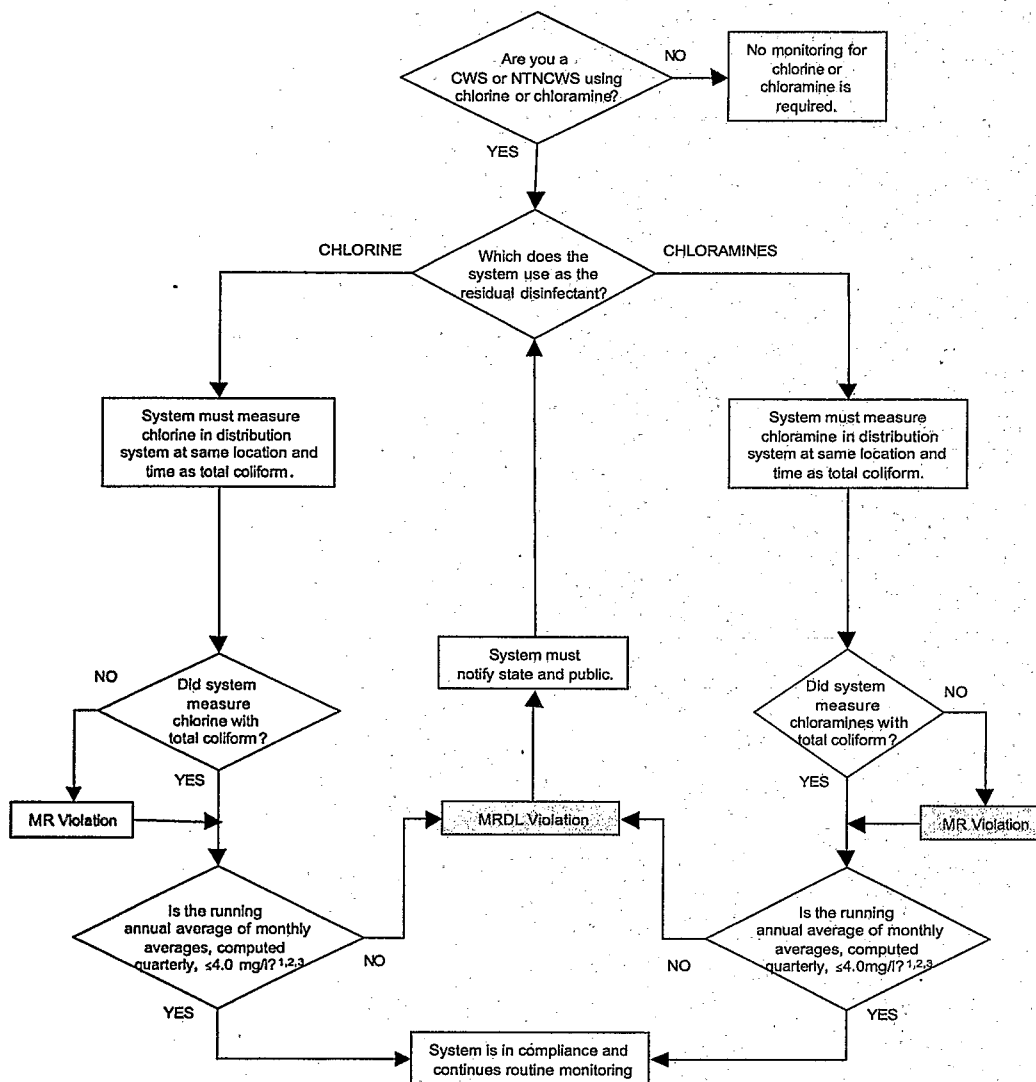
TTHM & HAA5 Monitoring for Ground Water Systems Serving $\geq 10,000$ Persons



NOTES

- 1) If more than 1 sample is taken, 25% must reflect maximum residence time.
- 2) Multiple wells drawing water from a single aquifer may be considered one treatment plant.
- 3) If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.
- 4) Average of all samples taken in the year or the result of the sample for systems which must monitor no more frequently than annually.

Monitoring Requirements for Chlorine and Chloramine



NOTES

1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

(Attachment 5) I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

You must conduct the monitoring, compliance determinations, reporting ; and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.
- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be made available for review by the state and public.

(Attachment 5) I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	One sample per plant per year during month of warmest water temperature	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES:

1. Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with state approval.
2. If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per 3-year cycle during month of warmest water temperature	Location representative of maximum residence time.	<ul style="list-style-type: none"> • Annual average TTHM \leq 0.040 mg/L & annual average HAA5 \leq 0.030 mg/L for 2 consecutive years; OR • Annual average TTHM \leq 0.020 mg/L & annual average HAA5 \leq 0.015 mg/L for 1 year
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 5) I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the MCLs and MRDLs of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	<p>Average of samples taken in the year.</p> <ul style="list-style-type: none"> • If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must go to increased monitoring immediately. If a system on increased monitoring exceeds the MCL, it is in violation.
Chlorine and Chloramines	<p>Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.</p> <ul style="list-style-type: none"> • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.
3. If during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

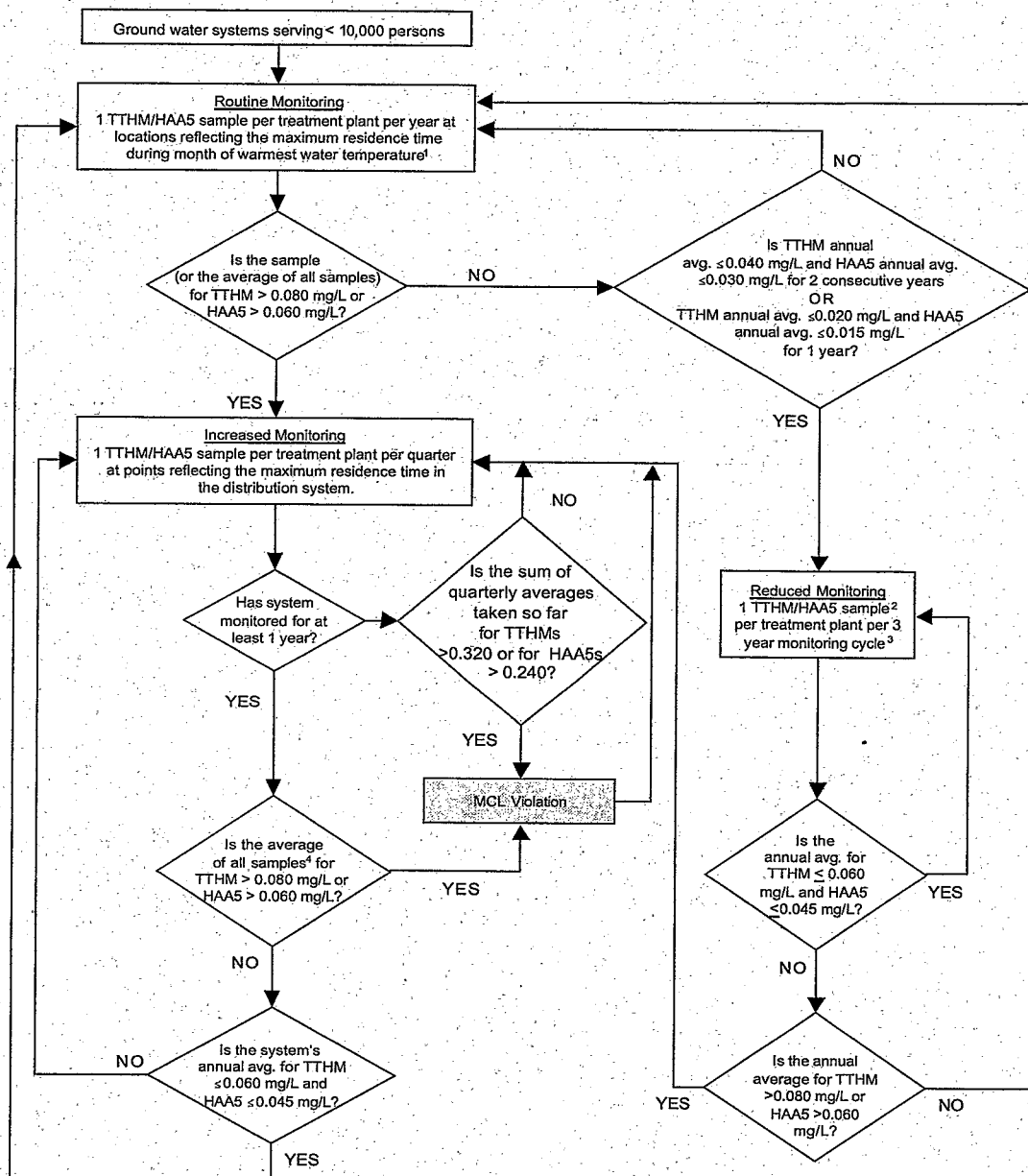
What do I have to REPORT to the State under the Stage 1 DBPR?

Chemical	What must be reported
TTHM and HAA5	<ul style="list-style-type: none"> • Number of samples taken during last year • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded <p><i>If conducting reduced monitoring:</i></p> <ul style="list-style-type: none"> • Location, date, result of last sample taken • Whether MCL was exceeded
Chlorine and Chloramines	<ul style="list-style-type: none"> • Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

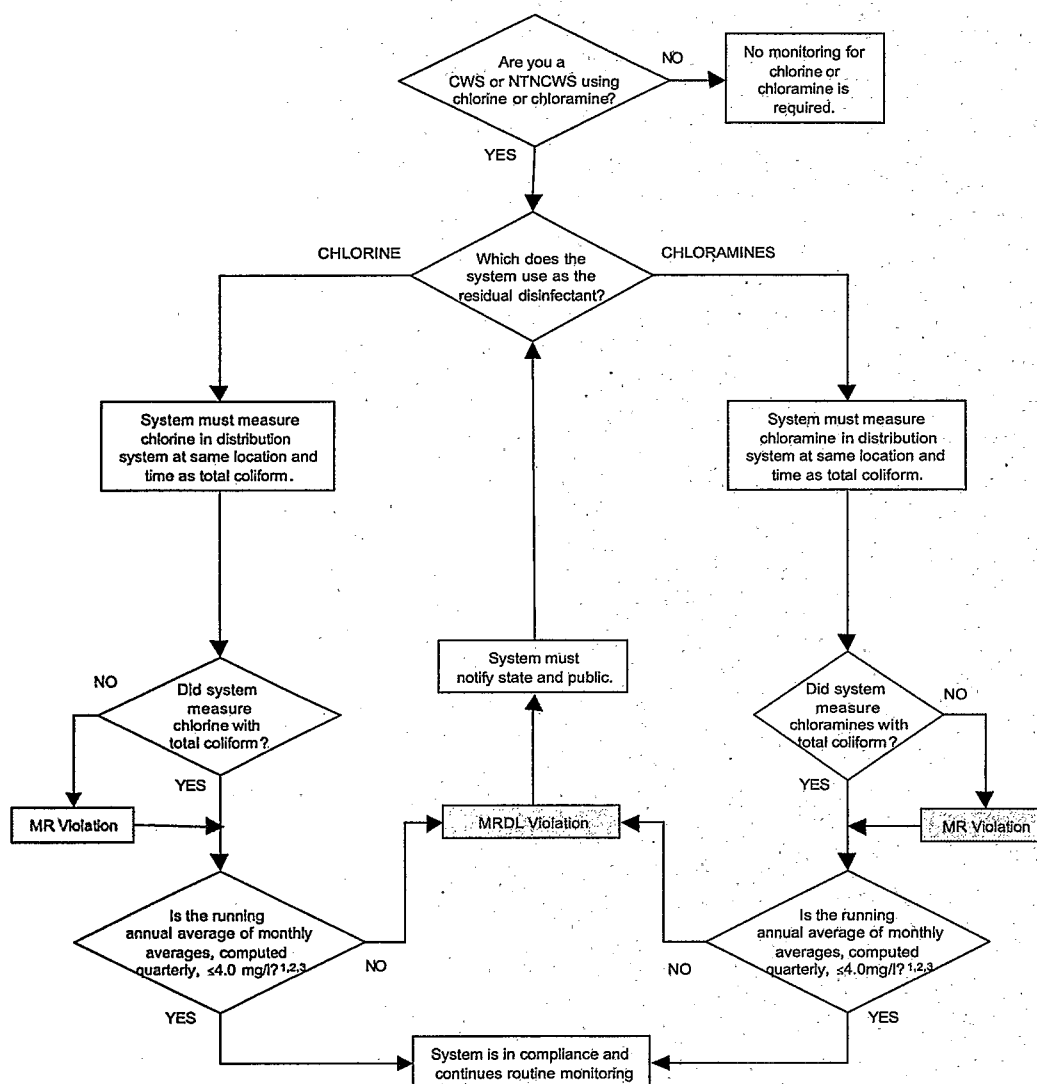
TTHM & HAA5 Monitoring for Ground Water Systems Serving < 10,000 Persons



NOTES

- 1) If a system elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.
- 2) Samples must be taken during month of warmest water temperature at location representing the maximum residence time.
- 3) 3 year cycle begins on January 1 following the quarter in which system qualifies for reduced monitoring.
- 4) If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.

Monitoring Requirements for Chlorine and Chloramine



NOTES

1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a treatment plant that uses chlorine dioxide. . .

(Attachment 6) I operate a treatment plant that uses chlorine dioxide . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
Chlorite	Daily	Entrance to the distribution system.
	One 3-sample set per month	Near first customer, location representative of average residence time, location representative of maximum residence time in distribution system.
	Additional: On any day following any daily sample that exceeds 1.0 mg/L, system must take 3 samples	Near first customer, location representative of average residence time, location representative of maximum residence time in distribution system. The system may use results to meet monthly 3-sample set monitoring requirement if the monthly 3-sample set has not yet been taken.
Chlorine Dioxide	Daily	Entrance to the distribution system.
	Additional: For any daily sample that exceeds the MRDL, system must take 3 samples	<ul style="list-style-type: none">• For chlorine dioxide, chloramines, or chlorine used to maintain disinfectant residual and NO booster chlorination: all samples as close as possible to first customer at intervals of at least 6 hours• If chlorine is used to maintain disinfectant residual AND booster chlorination: as close as possible to first customer, location representative of average residence time, as close as possible to end of distribution system

NOTES:

1. Not required for transient noncommunity water systems

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
Chlorite (daily)	No reduced monitoring	NA	NA
Chlorite (monthly)	One 3-sample set per quarter	Near first customer, location representative of average residence time, location representative of maximum residence time in distribution system.	<ul style="list-style-type: none">• No daily sample has exceeded the MCL• No additional monitoring has been required• No quarterly sample exceeds the MCL
Chlorine Dioxide	No reduced monitoring	NA	NA

NOTES:

1. Not required for transient noncommunity water systems

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the MCLs and MRDLs of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
Chlorite	Average of 3-sample sets. <ul style="list-style-type: none">• If arithmetic average of any 3-sample set in the month exceeds the MCL, the system is in violation.• The system must notify the public and report to the state if in violation.
Chlorine Dioxide— Acute Violation	Consecutive daily samples collected. <ul style="list-style-type: none">• If any daily sample taken at entrance to distribution system exceeds 0.8 mg/L, and on the following day 1 or more of the 3 samples taken in the distribution system exceeds 0.8 mg/L, the system is in acute violation.• The system must take immediate corrective action to lower the level of chlorine dioxide below 0.8 mg/L, notify the public and report to the state.• Failure to take samples in the distribution system following an exceedance of the MRDL at the entrance to the distribution system is also an acute violation. System must notify public of acute violation.
Chlorine Dioxide— Nonacute Violation	Consecutive daily samples collected. <ul style="list-style-type: none">• If any two consecutive daily samples taken at entrance to distribution system exceed 0.8 mg/L, and all distribution system samples are below 0.8 mg/L, the system is in nonacute violation.• The system must take immediate corrective action to lower the level of chlorine dioxide below 0.8 mg/L, notify the public and report to the state.• Failure to take samples at the distribution system entrance following an exceedance of the MRDL is also a violation. System must notify public of nonacute violation.

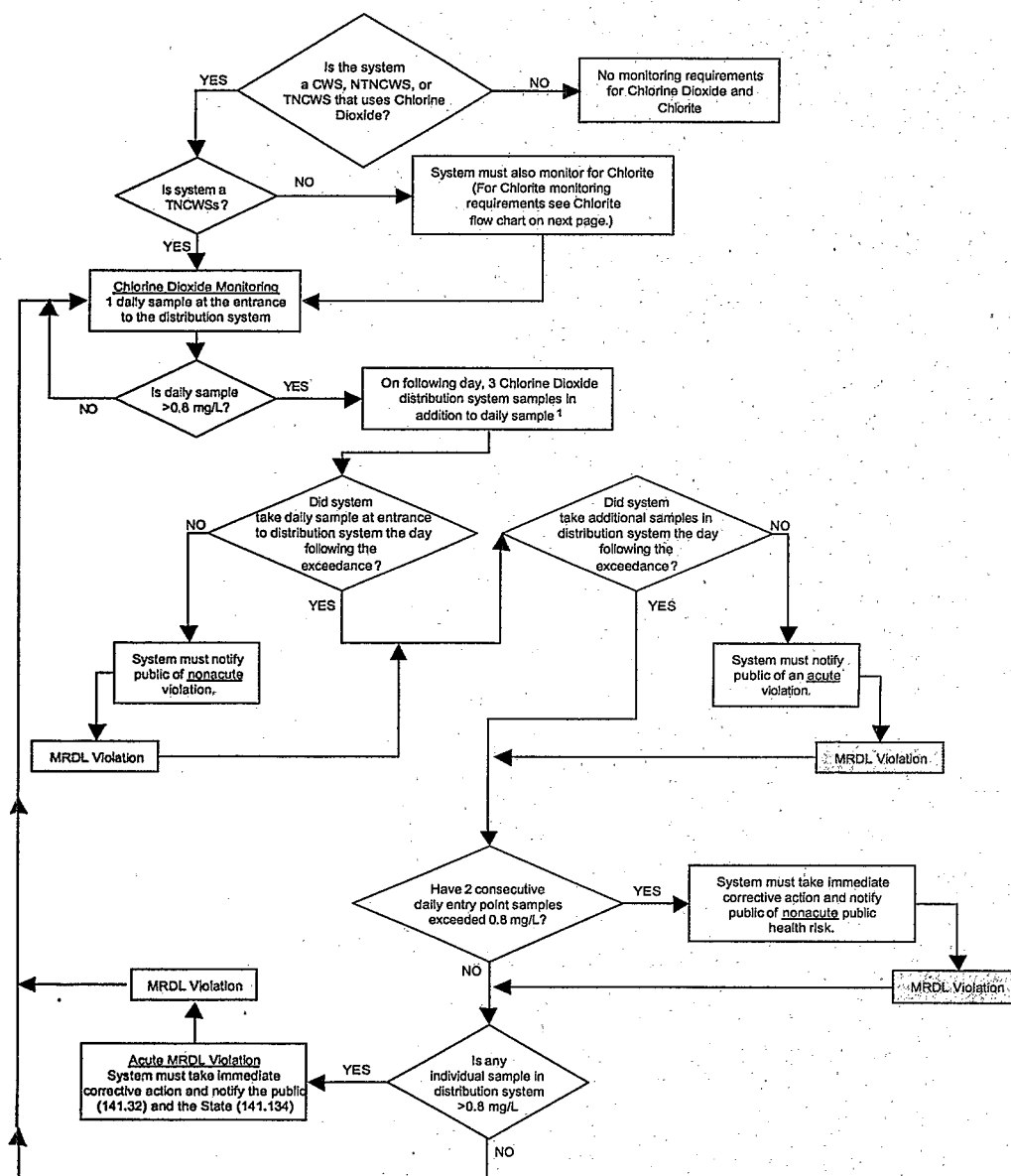
What do I have to REPORT to the State under the Stage 1 DBPR?

Chemical	What must be reported
Chlorite	<ul style="list-style-type: none">• Number of samples taken each month for last 3 months• Location, date, result of each sample taken during last quarter• For each month in the reporting period, the arithmetic average of all samples taken in the month• Whether MCL was exceed based on 3-sample set average and in which month it was exceeded.
Chlorine Dioxide	<ul style="list-style-type: none">• Dates, results, locations of samples taken during last quarter• Whether MRDL was exceeded• Whether MRDL was exceeded in any two consecutive daily samples and whether resulting violation was acute or nonacute

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

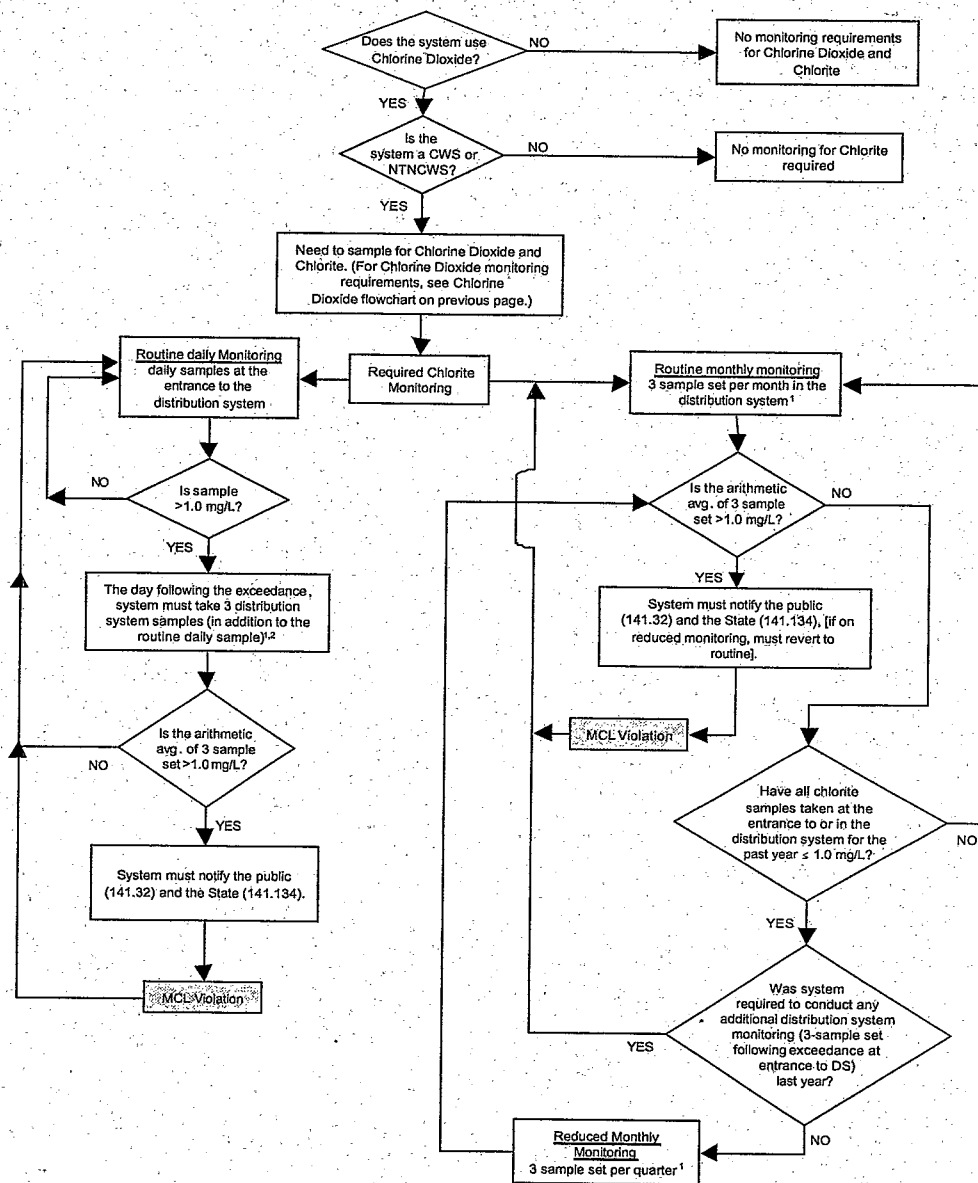
Chlorine Dioxide Monitoring for Systems Using Chlorine Dioxide



NOTES

1) If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system (DS), or if chlorine is used to maintain a disinfectant residual in the DS and there are no disinfection addition points (i.e., no booster chlorination) after the entrance to the DS, the system must take 3 samples as close to the first customer as possible, at intervals of at least every 6 hours. If chlorine is used to maintain a disinfectant residual in the DS and there are one or more booster chlorination stations, the system must take one sample as close to the 1st customer as possible, one in a location representative of average residence time, and one as close to the end of the distribution system as possible.

Chlorite Monitoring Requirements for Systems Using Chlorine Dioxide



Note:

- 1) The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system.
- 2) If the system has not performed the routine monthly sampling for chlorite, they can use this 3 sample set for their monthly chlorite samples.

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I operate a treatment plant that uses ozone . . .

(Attachment 7) I operate a treatment plant that uses ozone . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
Bromate	One sample per ozone plant per month	Entrance to the distribution system.
Bromide	One sample per ozone plant per month	In source water (only required if the system wishes to qualify for reduced bromate monitoring).

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
Bromate	One sample per ozone plant per quarter	Entrance to the distribution system.	<ul style="list-style-type: none">Annual average source water bromide concentration < 0.05 mg/L
Bromide	No reduced monitoring if wishing to conduct reduced bromate monitoring	NA	NA

NOTES:

1. System must resume monthly bromate monitoring if running annual average of source water bromide ≥ 0.05 mg/L.

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the bromate MCL in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
Bromate	<p>Running annual arithmetic average, computed quarterly, of monthly samples (or average of all samples taken during the month if more than 1 sample was collected).</p> <ul style="list-style-type: none">• If average of samples covering any consecutive 4-quarter period exceeds the MCL, the system is in violation.• The system must notify the public and report to the state if in violation.

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.
3. If during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

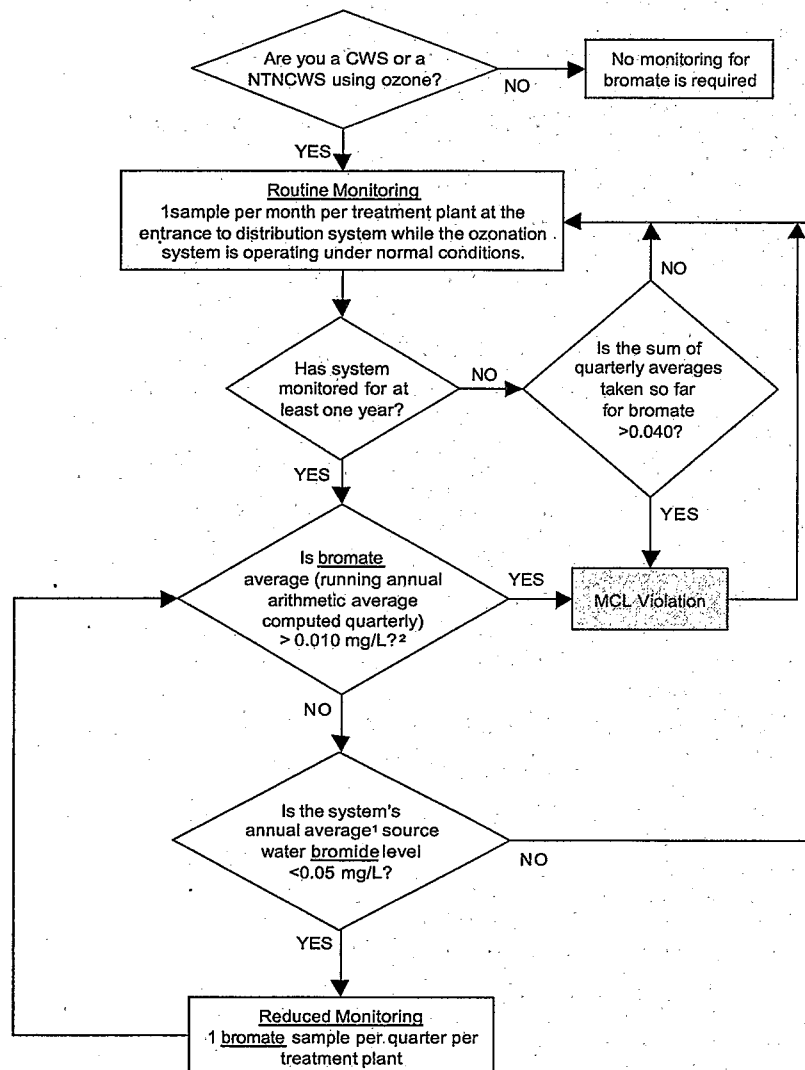
What do I have to REPORT to the State under the Stage 1 DBPR?

Chemical	What must be reported
Bromate	<ul style="list-style-type: none">• Number of samples taken during last quarter• Location, date, result of each sample taken during last quarter• Arithmetic average of monthly arithmetic averages of all samples taken in last year• Whether MCL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

Monitoring Requirements for Bromate for Systems using Ozonation



Notes:

- 1) The average is based upon representative monthly bromide measurements for one year (in months where more than one sample is taken, use the average of all samples taken during the month).
- 2) If a PWS fails to complete 12 mos of monitoring, compliance must be based on average of available data.

I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

Enhanced Coagulation and Enhanced Precipitative Softening Treatment Technique

What is the goal of enhanced coagulation and enhanced precipitative softening?

The goal of enhanced coagulation and precipitative softening is to provide additional removal of the natural organic material (referred to as total organic carbon or "TOC") that is a precursor to DBP formation. TOC and disinfectants commonly used in drinking water treatment can combine to form DBPs. Adding additional amounts of coagulant or lime to coagulation or softening treatment trains, respectively, can increase the amount of TOC removed and thereby lower DBP levels in finished water.

Which public water systems does the treatment technique apply to?

The treatment technique applies to Subpart H systems (systems using surface water or groundwater under the direct influence of surface water) that use conventional treatment. Conventional treatment is defined in §141.2 as a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

How is the treatment technique implemented by public water systems?

Public water systems (PWSs) that use conventional treatment are required to remove a percentage of TOC from the raw water. The percent removal is based on raw water TOC and alkalinity levels. A pair of TOC samples must be taken simultaneously in the raw water and no later than the combined filter effluent at least once per month to calculate the percent removal and demonstrate compliance via a running annual average. PWS unable to meet the required TOC removal may set an alternative TOC percent removal based on jar or pilot testing that reflects the treatability of their water. PWSs may also use one of the alternative compliance criteria to demonstrate compliance.

When is the treatment technique effective?

The treatment technique is effective for systems serving 10,000 or more people in January 2002. The effective date for systems serving under 10,000 people is January 2004.

(Attachment 8) I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

What ROUTINE MONITORING must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TOC and Alkalinity (conventional treatment)	One paired TOC sample per plant per month One alkalinity sample per plant per month at same time as source water TOC sample is taken	TOC (paired samples) <ul style="list-style-type: none"> • In source water prior to any treatment • No later than the point of combined filter effluent turbidity monitoring and representative of filtered water Alkalinity <ul style="list-style-type: none"> • Same location as source water TOC sample is taken.

What REDUCED MONITORING may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TOC and Alkalinity (conventional treatment)	One paired TOC sample per plant per quarter One alkalinity sample per plant per quarter at same time as source water TOC sample is taken	TOC (paired samples) <ul style="list-style-type: none"> • In source water prior to any treatment • No later than the point of combined filter effluent turbidity monitoring and representative of filtered water Alkalinity <ul style="list-style-type: none"> • Same location as source water TOC sample is taken. 	Average treated water TOC < 2.0 mg/L for 2 consecutive years or <1.0 mg/L for 1 year

(Attachment 8) I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

How do I DETERMINE IF MY SYSTEM IS IN COMPLIANCE with the TOC removal requirements of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TOC (conventional treatment)	"Step 1" or "Step 2" removal targets or alternative compliance criteria (see flowcharts for determining TOC compliance)

NOTES:

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with the treatment technique, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

What do I have to REPORT to the State under the Stage 1 DBPR?

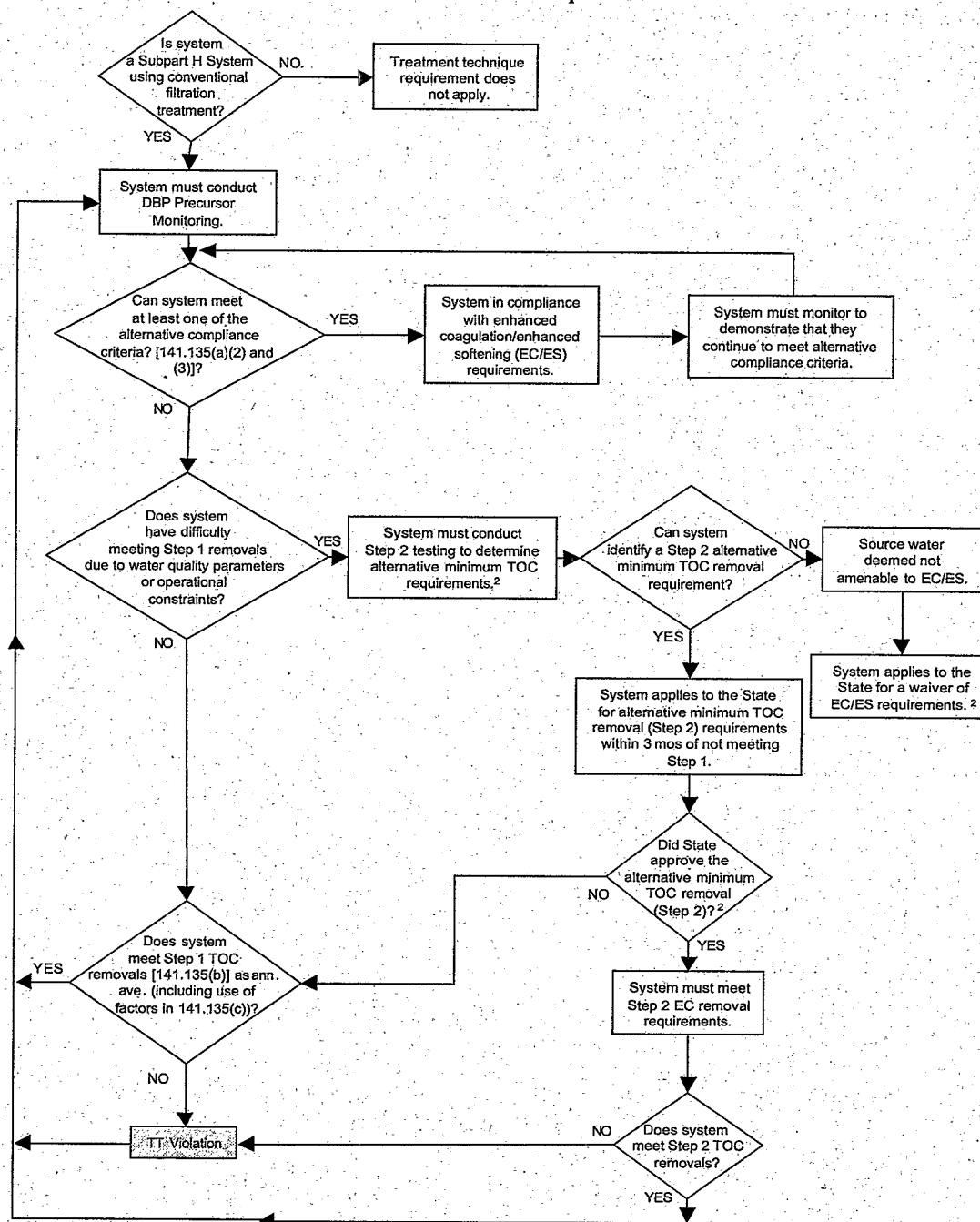
Chemical	What must be reported
TOC and Alkalinity (conventional treatment)	<ul style="list-style-type: none">• Number of paired samples taken during last quarter• Location, date, result of each paired sample and associated alkalinity taken during last quarter• For systems using Step 1 or Step 2, enhanced coagulation or enhanced softening<ul style="list-style-type: none">• For each month in the reporting period, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal• Calculations for determining compliance with the TOC percent removal requirements• For systems using an alternative compliance criterion<ul style="list-style-type: none">• Running annual arithmetic average of source water SUVA or treated water SUVA if using this criterion for alternative compliance• Running annual arithmetic average based on monthly average of source or treated water TOC if using this criterion for alternative compliance• Running annual arithmetic average of source water alkalinity or treated water alkalinity if using this criterion for alternative compliance• Running annual average for both TTHM and HAA5 if using this criterion for alternative compliance• Running annual average of amount of magnesium hardness removal if using this criterion for alternative compliance• Whether system is in compliance with particular alternative compliance criterion• Whether system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements for the last 4 quarters

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

(Attachment 8) I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

**Disinfection Byproducts Precursor Removal
Treatment Technique**

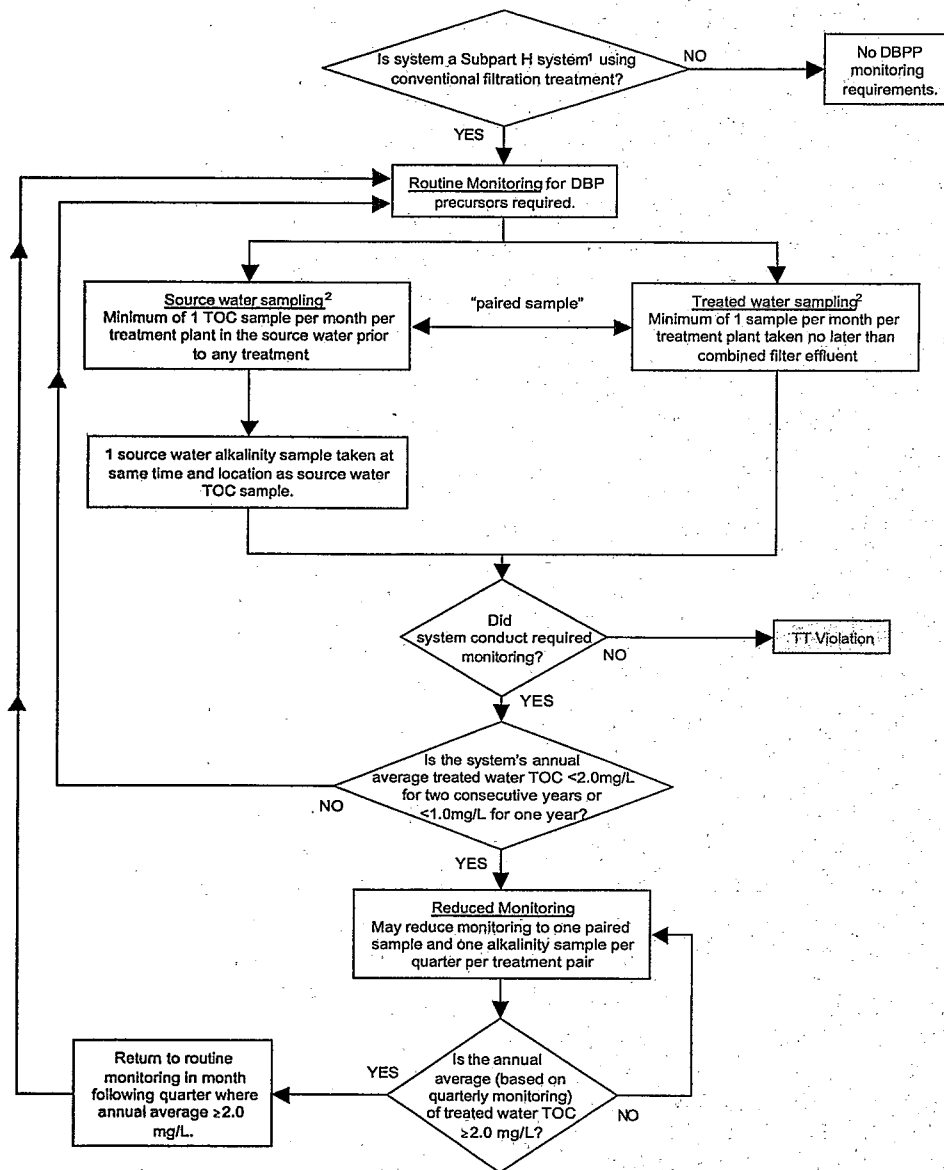


Notes:

- 1) Subpart H = Public water systems using surface water or ground water under the direct influence of surface water.
- 2) Until the state approves alternate Step 2, system must meet Step 1 removals.

(Attachment 8) I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

Monitoring Requirements for Disinfection Byproduct Precursors (DBPP)



Notes:

- 1.) Subpart H = Public water systems using surface water or ground water under the direct influence of surface water.
- 2.) The source water and the treated water samples are referred to as "paired samples" and are to be taken simultaneously

Appendix E

Stage 1 DPBR Rule Language

This appendix contains the rule language for the Stage 1 DBPR incorporating the technical amendments. Changes to the original rule language are shown as highlighted text. A complete electronic copy of the Stage 1 DBPR, including preamble as published on December 16, 1998, can be found at the EPA web site at www.epa.gov/OGWDW/ndbp/dbpr.html. A complete electronic copy of the technical amendments for the IESWTR and Stage 1 DBPR, including preamble as published on January 16, 2001, can be found on the EPA website at www.epa.gov/safewater/ndbp/iesfr.html.

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For the reasons set out in the preamble, title 40 chapter I of the Code of Federal Regulations is amended as follows:

PART 9 – [AMENDED]

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 et seq., 136-136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601-2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 et seq., 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971-1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-1, 300j-2, 300j-3, 300j-4, 300j-9, 1857 et seq., 6901-6992k, 7401-7671q, 7542, 9601-9657, 11023, 11048.

2. Section 9.1 is amended by adding the new entries to the table to read as follows:

§9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *				
<u>40 CFR Citation</u>		<u>OMB Control No.</u>		
* * * * *				

National Primary Drinking Water Regulations

141.130 – 141.132 2040-0204

141.134 – 141.135 2040-0204

* * * * *

Part 141 - National Primary Drinking Water Regulations

3. The authority citation for Part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

4. Section 141.2 is amended by adding the following definitions in alphabetical order to read as follows:

§ 141.2 Definitions.

* * * * *

Enhanced coagulation means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

* * * * *

Enhanced softening means the improved removal of disinfection byproduct precursors by precipitative softening.

* * * * *

GAC10 means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days.

* * * * *

Haloacetic acids (five) (HAA5) mean the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

* * * * *

Maximum residual disinfectant level (MRDL) means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. For chlorine and chloramines, a PWS is in compliance with the MRDL when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a PWS is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels under Section 1412 of the Safe

Drinking Water Act. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in §141.65, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

* * * *

Maximum residual disinfectant level goal (MRDLG) means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

* * * *

Subpart H systems means public water systems using surface water or ground water under the direct influence of surface water as a source that are subject to the requirements of subpart H of this part.

* * * *

SUVA means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of a water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

* * * *

Total Organic Carbon (TOC) means total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

* * * *

5. Section 141.12 is revised to read as follows:

§141.12 Maximum contaminant levels for total trihalomethanes.

The maximum contaminant level of 0.10 mg/L for total trihalomethanes (the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform)) applies to subpart H community water systems which serve a population of 10,000 people or more until December 31, 2001. This level applies to community water systems that use only ground water not under the direct influence of surface water and serve a population of 10,000 people or more until December 31, 2003. Compliance with the maximum contaminant level for total trihalomethanes is calculated pursuant to §141.30. After December 31, 2003, this section is no longer applicable.

6. Section 141.30 is amended by revising the the first sentences in paragraphs (d) and (f) and adding paragraph (h) to read as follows:

§141.30 Total trihalomethanes sampling, analytical and other requirements.

* * * *

(d) Compliance with §141.12 shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in paragraph (b)(1) or (2) of this section.

(e) Sampling and analyses made pursuant to this section shall be conducted by one of the total trihalomethanes methods as directed in §141.24(e), and the Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, which is available from NTIS, PB-104766, or in §141.131(b).

* * * *

(f) Before a community water system makes any significant modifications to its existing treatment process for the purposes of achieving compliance with §141.12, such system must submit and obtain State approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modification. ***

* * * *

(h) The requirements in paragraphs (a) - (g) of this section apply to subpart H community water systems which serve a population of 10,000 or more until December 31, 2001. The requirements in paragraphs (a)

through (g) of this section apply to community water systems which use only ground water not under the direct influence of surface water that add a disinfectant (oxidant) in any part of the treatment process and serve a population of 10,000 or more until December 31, 2003. After December 31, 2003, this section is no longer applicable.

7. Section 141.32 is amended by revising the heading in paragraph (a) introductory text, the first sentence of paragraph (a)(1)(iii) introductory text, the first sentence of paragraph (c) introductory text, the first sentence of paragraph (e) introductory text, and adding paragraphs (a)(1)(iii)(E) and (e)(76) through (81), to read as follows:

Section 141.32 - Public notification.

* * * * *

(a) Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs). ***

(1) ***

(iii) For violations of the MCLs of contaminants or MRDLs of disinfectants that may pose an acute risk to human health, by furnishing a copy of the notice to the radio and television stations serving the area served by the public water system as soon as possible but in no case later than 72 hours after the violation. ***

* * * * *

(E) Violation of the MRDL for chlorine dioxide as defined in §141.65 and determined according to §141.133(c)(2).

* * * * *

(c) *** The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, or any maximum residual disinfectant level, or any treatment technique requirement, or any variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins.

* * * * *

(e) ***

(76) Chlorine. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorine is a health concern at certain levels of exposure. Chlorine is added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and is also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chlorine has been shown to affect blood and the liver in laboratory animals. EPA has set a drinking water standard for chlorine to protect against the risk of these adverse effects. Drinking water which meets this EPA standard is associated with little to none of this risk and should be considered safe with respect to chlorine.

(77) Chloramines. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chloramines are a health concern at certain levels of exposure. Chloramines are added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and are also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chloramines have been shown to affect blood and the liver in laboratory animals. EPA has set a drinking water standard for chloramines to protect against the risk of these adverse effects. Drinking water which meets this EPA standard is associated with little to none of this risk and should be considered safe with respect to chloramines.

(78) Chlorine Dioxide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorine dioxide is a health concern at certain levels of exposure. Chlorine dioxide is used in water treatment to kill bacteria and other disease-causing microorganisms and can be used to control tastes and odors. Disinfection is required for surface water systems. However, at high doses, chlorine dioxide-treated drinking water has been shown to affect blood in laboratory animals. Also, high levels of chlorine dioxide given to laboratory animals in drinking water have been shown to cause neurological effects on the developing nervous system. These neurodevelopmental effects may occur as a result of a short-term excessive chlorine dioxide exposure. To protect against such potentially harmful

exposures, EPA requires chlorine dioxide monitoring at the treatment plant, where disinfection occurs, and at representative points in the distribution system serving water users. EPA has set a drinking water standard for chlorine dioxide to protect against the risk of these adverse effects. **[In addition to the language in this introductory text of paragraph (e)(78), systems must include either the language paragraph (e)(78)(i) or (e)(78)(ii) of this section. Systems with a violation at the treatment plant, but not in the distribution system, are required to use the language in paragraph (e)(78)(i) of this section and treat the violation as a nonacute violation. Systems with a violation in the distribution system are required to use the language in paragraph (e)(78)(ii) of this section and treat the violation as an acute violation.]**

(i) The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, and do not include violations within the distribution system serving users of this water supply. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to present consumers.

(ii) The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system serving water users. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including pregnant women, infants, and young children, may be especially susceptible to adverse effects of excessive exposure to chlorine dioxide-treated water. The purpose of this notice is to advise that such persons should consider reducing their risk of adverse effects from these chlorine dioxide violations by seeking alternate sources of water for human consumption until such exceedances are rectified. Local and State health authorities are the best sources for information concerning alternate drinking water.

(79) Disinfection Byproducts and Treatment technique for DBPs. The United States Environmental Protection Agency (EPA) sets drinking water standards and requires the disinfection of drinking water. However, when used in the treatment of drinking water, disinfectants react with naturally-occurring organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA has determined that a number of DBPs are a health concern at certain levels of exposure. Certain DBPs, including some trihalomethanes (THMs) and some haloacetic acids (HAAs), have been shown to cause cancer in laboratory animals. Other DBPs have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to certain DBPs may produce similar effects in people. EPA has set standards to limit exposure to THMs, HAAs, and other DBPs.

(80) Bromate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that bromate is a health concern at certain levels of exposure. Bromate is formed as a byproduct of ozone disinfection of drinking water. Ozone reacts with naturally occurring bromide in the water to form bromate. Bromate has been shown to produce cancer in rats. EPA has set a drinking water standard to limit exposure to bromate.

(81) Chlorite. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorite is a health concern at certain levels of exposure. Chlorite is formed from the breakdown of chlorine dioxide, a drinking water disinfectant. Chlorite in drinking water has been shown to affect blood and the developing nervous system. EPA has set a drinking water standard for chlorite to protect against these effects. Drinking water which meets this standard is associated with little to none of these risks and should be considered safe with respect to chlorite.

* * * * *

8. Subpart F is amended by revising the subpart title and adding §§141.53 and 141.54 to read as follows:

SUBPART F - MAXIMUM CONTAMINANT LEVEL GOALS AND MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS

* * * * *

§141.53 - Maximum contaminant level goals for disinfection byproducts.

MCLGs for the following disinfection byproducts are as indicated:

<u>Disinfection byproduct</u>	<u>MCLG(mg/L)</u>
Bromodichloromethane	Zero
Bromoform	Zero

Bromate	Zero
Dichloroacetic acid	Zero
Trichloroacetic acid	0.3
Chlorite	0.8
Dibromochloromethane	0.06

§141.54 - Maximum residual disinfectant level goals for disinfectants.

MRDLGs for disinfectants are as follows:

<u>Disinfectant Residual</u>	<u>MRDLG(mg/L)</u>
Chlorine	4 (as Cl ₂)
Chloramines	4 (as Cl ₂)
Chlorine dioxide	0.8 (as ClO ₂)

9. Subpart G, Maximum Contaminant Levels, is amended by revising the subpart heading and adding §§141.64 and 141.65 to read as follows:

**SUBPART G - NATIONAL REVISED PRIMARY DRINKING WATER REGULATIONS:
MAXIMUM CONTAMINANT LEVELS AND MAXIMUM RESIDUAL DISINFECTANT LEVELS**

* * * * *

Section 141.64 - Maximum contaminant levels for disinfection byproducts.

(a) The maximum contaminant levels (MCLs) for disinfection byproducts are as follows:

<u>Disinfection byproduct</u>	<u>MCL (mg/L)</u>
Total trihalomethanes (TTHM)	0.080
Haloacetic acids (five) (HAA5)	0.060
Bromate	0.010
Chlorite	1.0

(b) Compliance Dates.

(1) CWSs and NTNCWSs. Subpart H systems serving 10,000 or more persons must comply with this section beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(2) A system that is installing GAC or membrane technology to comply with this section may apply to the State for an extension of up to 24 months past the dates in paragraphs (b)(1) of this section, but not beyond December 31, 2003. In granting the extension, States must set a schedule for compliance and may specify any interim measures that the system must take. Failure to meet the schedule or interim treatment requirements constitutes a violation of a National Primary Drinking Water Regulation.

(c) The Administrator, pursuant to Section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for disinfection byproducts identified in paragraph (a) of this section:

DISINFECTION BYPRODUCT

TTHM

HAA5

Bromate

Chlorite

BEST AVAILABLE TECHNOLOGY

Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.

Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.

Control of ozone treatment process to reduce production of bromate.

Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

Section 141.65 - Maximum residual disinfectant levels.

(a) Maximum residual disinfectant levels (MRDLs) are as follows:

<u>Disinfectant Residual</u>	<u>MRDL (mg/L)</u>
Chlorine	4.0 (as Cl_2).
Chloramines	4.0 (as Cl_2).
Chlorine dioxide	0.8 (as ClO_2).

(b) Compliance dates.

(1) CWSs and NTNCWSs. Subpart H systems serving 10,000 or more persons must comply with this section beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this subpart beginning January 1, 2004.

(2) Transient NCWSs. Subpart H systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

(c) The Administrator, pursuant to Section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum residual disinfectant levels identified in paragraph (a) of this section: control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

10. A new subpart L is added to read as follows:

SUBPART L - Disinfectant Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors

Sec.

141.130 General requirements.

141.131 Analytical requirements.

141.132 Monitoring requirements.

141.133 Compliance.

141.134 Reporting and recordkeeping requirements.

141.135 Treatment technique for control of disinfection byproduct (DBP) precursors.

§141.130 General requirements.

(a) The requirements of this Subpart L constitute national primary drinking water regulations.

(1) The regulations in this subpart establish criteria under which community water systems (CWSs) and nontransient, noncommunity water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process, must modify their practices to meet MCLs and MRDLs in §§141.64 and 141.65, respectively, and must meet the treatment technique requirements for disinfection byproduct precursors in §141.135.

(2) The regulations in this subpart establish criteria under which transient NCWSs that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the MRDL for chlorine dioxide in §141.65.

(3) EPA has established MCLs for TTHM and HAA5 and treatment technique requirements for disinfection byproduct precursors to limit the levels of known and unknown disinfection byproducts which may have adverse health effects. These disinfection byproducts may include chloroform; bromodichloromethane; dibromochloromethane; bromoform; dichloroacetic acid; and trichloroacetic acid.

(b) Compliance dates. (1) CWSs and NTNCWSs. Unless otherwise noted, systems must comply with the requirements of this subpart as follows. Subpart H systems serving 10,000 or more persons must comply with this subpart beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this subpart beginning January 1, 2004.

(2) Transient NCWSs. Subpart H systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide and chlorite in this subpart beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide and chlorite in this subpart beginning January 1, 2004.

(c) Each CWS and NTNCWS regulated under paragraph (a) of this section must be operated by qualified personnel who meet the requirements specified by the State and are included in a State register of qualified operators.

(d) Control of Disinfectant Residuals. Notwithstanding the MRDLs in §141.65, systems may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

§141.131 Analytical requirements.

(a) General. (1) Systems must use only the analytical method(s) specified in this section, or otherwise approved by EPA for monitoring under this subpart, to demonstrate compliance with the requirements of this subpart. These methods are effective for compliance February 16, 1999.

(2) The following documents are incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460, or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington DC. EPA Method 552.1 is in Methods for the Determination of Organic Compounds in Drinking Water-Supplement II, USEPA, August 1992, EPA/600/R-92/129 (available through National Information Technical Service (NTIS), PB92-207703). EPA Methods 502.2, 524.2, 551.1, and 552.2 are in Methods for the Determination of Organic Compounds in Drinking Water-Supplement III, USEPA, August 1995, EPA/600/R-95/131. (available through NTIS, PB95-261616). EPA Method 300.0 is in Methods for the Determination of Inorganic Substances in Environmental Samples, USEPA, August 1993, EPA/600/R-93/100. (available through NTIS, PB94-121811). EPA Method 300.1 is titled USEPA Method 300.1, Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0, USEPA, 1997, EPA/600/R-98/118 (available through NTIS, PB98-169196); also available from: Chemical Exposure Research Branch, Microbiological & Chemical Exposure Assessment Research Division, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH 45268, Fax Number: 513-569-7757, Phone number: 513-569-7586. Standard Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO₂ D, 4500-ClO₂ E, 6251 B, and 5910 B shall be followed in accordance with Standard Methods for the Examination of Water and Wastewater, 19th Edition, American Public Health Association, 1995; copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005. Standard Methods 5310 B, 5310 C, and 5310 D shall be followed in accordance with the Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 1996; copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005. ASTM Method

D 1253-86 shall be followed in accordance with the Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996 edition; copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

(b) Disinfection Byproducts. (1) Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table:

APPROVED METHODS FOR DISINFECTION BYPRODUCT COMPLIANCE MONITORING
BYPRODUCT MEASURED¹

METHODOLOGY ²	EPA METHOD	STANDARD METHOD	TTHM	HAA5	CHLORITE ⁴	BROMATE
P&T/GC/EICD & PID	502.2 ³		X			
P&T/GC/MS	524.2		X			
LLE/GC/ECD	551.1		X			
LLE/GC/ECD		6251 B		X		
SPE/GC/ECD	552.1			X		
LLE/GC/ECD	552.2			X		
Amperometric Titration		4500-ClO ₂ E			X	
IC	300.0				X	
IC	300.1				X	X

¹-X indicates method is approved for measuring specified disinfection byproduct.

²-P&T = purge and trap; GC = gas chromatography; EICD = electrolytic conductivity detector; PID = photoionization detector; MS = mass spectrometer; LLE = liquid/liquid extraction; ECD = electron capture detector; SPE = solid phase extractor; IC = ion chromatography.

³-If TTHMs are the only analytes being measured in the sample, then a PID is not required.

⁴-Amperometric titration may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in §141.132(b)(2)(i)(A). Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in §141.132(b)(2)(i)(B) and (b)(2)(ii).

(2) Analysis under this section for disinfection byproducts must be conducted by laboratories that have received certification by EPA or the State, except as specified under paragraph (b)(3) of this section. To receive certification to conduct analyses for the contaminants in §141.64(a), the laboratory must carry out annual analyses of performance evaluation (PE) samples approved by EPA or the State. In these analyses of PE samples, the laboratory must achieve quantitative results within the acceptance limit on a minimum of 80% of the analytes included in each PE sample. The acceptance limit is defined as the 95% confidence interval calculated around the mean of the PE study data between a maximum and minimum acceptance limit of +/- 50% and +/- 15% of the study mean.

(3) A party approved by EPA or the State must measure daily chlorite samples at the entrance to the distribution system.

(c) Disinfectant Residuals. (1) Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in the following table:

APPROVED METHODS FOR DISINFECTANT RESIDUAL COMPLIANCE MONITORING

Residual Measured¹

Methodology	Standard Method	ASTM Method	Free Chlorine	Combined Chlorine	Total Chlorine	Chlorine Dioxide
Amperometric Titration	4500-Cl D,	D 1253-86	X	X	X	
Low Level Amperometric Titration	4500-Cl E				X	
DPD Ferrous Titrimetric	4500-Cl F		X	X	X	
DPD Colorimetric	4500-Cl G		X	X	X	
Syringaldazine (FACTS)	4500-Cl H		X			
Iodometric Electrode	4500-Cl I				X	
DPD	4500-ClO ₂ D					X
Amperometric Method II	4500-ClO ₂ E					X

¹-X indicates method is approved for measuring specified disinfectant residual.

(2) If approved by the State, systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits.

(3) A party approved by EPA or the State must measure residual disinfectant concentration.

(d) Additional analytical methods. Systems required to analyze parameters not included in paragraphs (b) and (c) of this section must use the following methods. A party approved by EPA or the State must measure these parameters.

(1) Alkalinity. All methods allowed in §141.89(a) for measuring alkalinity.

(2) Bromide. EPA Method 300.0 or EPA Method 300.1.

(3) Total Organic Carbon (TOC). Standard Method 5310 B (High-Temperature Combustion Method) or Standard Method 5310 C (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D (Wet-Oxidation Method). TOC samples may not be filtered prior to analysis. TOC samples must either be analyzed or must be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 24 hours. Acidified TOC samples must be analyzed within 28 days.

(4) Specific Ultraviolet Absorbance (SUVA). SUVA is equal to the UV absorption at 254nm (UV₂₅₄) (measured in m⁻¹) divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV₂₅₄ and DOC. When determining SUVA, systems must use the methods stipulated in paragraph (d)(4)(i) of this section to measure DOC and the method stipulated in paragraph (d)(4)(ii) of this section to measure UV₂₅₄. SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and UV₂₅₄ samples used to determine a SUVA value must be taken at the same time and at the same location.

(i) Dissolved Organic Carbon (DOC). Standard Method 5310 B (High-Temperature Combustion Method) or Standard Method 5310 C (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D (Wet-Oxidation Method). Prior to analysis, DOC samples must be filtered

through a 0.45 µm pore-diameter filter. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC < 0.5 mg/L. DOC samples must be filtered through the 0.45 µm pore-diameter filter prior to acidification. DOC samples must either be analyzed or must be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 48 hours. Acidified DOC samples must be analyzed within 28 days.

(ii) Ultraviolet Absorption at 254 nm (UV₂₅₄). Method 5910 B (Ultraviolet Absorption Method). UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV₂₅₄ samples must be filtered through a 0.45 µm pore-diameter filter. The pH of UV₂₅₄ samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

(5) pH. All methods allowed in §141.23(k)(1) for measuring pH.

§141.132 Monitoring requirements.

(a) General requirements. (1) Systems must take all samples during normal operating conditions.

(2) Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with State approval in accordance with criteria developed under §142.16(h)(5) of this chapter.

(3) Failure to monitor in accordance with the monitoring plan required under paragraph (f) of this section is a monitoring violation.

(4) Failure to monitor will be treated as a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.

(5) Systems may use only data collected under the provisions of this subpart or subpart M to qualify for reduced monitoring.

(b) Monitoring requirements for disinfection byproducts.

(1) TTHMs and HAA5. (i) Routine monitoring. Systems must monitor at the frequency indicated in the following table:

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5

<u>Type of system</u>	<u>Minimum Monitoring Frequency</u>	<u>Sample Location in the distribution system</u>
Subpart H system serving at least 10,000 persons	four water samples per quarter per treatment plant	At least 25 percent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods ¹ .
Subpart H system serving from 500 to 9,999 persons	one water sample per quarter per treatment plant	Locations representing maximum residence time ¹ .
Subpart H system serving fewer than 500 persons	one sample per year per treatment plant during month of warmest water temperature	Locations representing maximum residence time ¹ . If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets reduced monitoring criteria in paragraph (b)(1)(iv) of this section.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	one water sample per quarter per treatment plant ²	Locations representing maximum residence time ¹ .
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	one sample per year per treatment plant ² during month of warmest water temperature	Locations representing maximum residence time ¹ . If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in paragraph (b)(1)(iv) of this section for reduced monitoring.

¹ If a system elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

² Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with State approval in accordance with criteria developed under §142.16(h)(5) of this chapter.

(ii) Systems may reduce monitoring, except as otherwise provided, in accordance with the following table:

REDUCED MONITORING FREQUENCY FOR TTHM AND HAA5

<u>IF YOU ARE A...</u>	<u>YOU MAY REDUCE MONITORING IF YOU HAVE MONITORED AT LEAST ONE YEAR AND YOUR...</u>	<u>TO THIS LEVEL</u>
Subpart H system serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/L	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L	one sample per treatment plant per quarter at distribution system location reflecting maximum residence time
Subpart H system serving from 500 to 9,999 persons which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/L	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: Any Subpart H system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L for two consecutive years OR TTHM annual average ≤ 0.020 mg/L and HAA5 annual average ≤ 0.015 mg/L for one year	one sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.

(iii) Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the frequency identified in paragraph (b)(1)(i) of this section (minimum frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L or 0.045 mg/L for TTHM or HAA5, respectively. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is >0.080 mg/L or the HAA5 annual average is >0.060 mg/L, the system must go to the increased monitoring identified in paragraph (b)(1)(i) of this section (sample location column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHMs or HAA5 respectively.

(iv) Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM annual average is ≤ 0.060 mg/L and their HAA5 annual average is ≤ 0.045 mg/L.

(v) The State may return a system to routine monitoring at the State's discretion.

(2) Chlorite. Community and nontransient noncommunity water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

(i) Routine monitoring. (A) Daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by paragraph (b)(2)(ii) of this section, in addition to the sample required at the entrance to the distribution system.

(B) Monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under paragraph (b)(2)(ii) of this section to meet the requirement for monitoring in this paragraph.

(ii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

(iii) Reduced monitoring. (A) Chlorite monitoring at the entrance to the distribution system required by paragraph (b)(2)(i)(A) of this section may not be reduced.

(B) Chlorite monitoring in the distribution system required by paragraph (b)(2)(i)(B) of this section may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under paragraph (b)(2)(i)(B) of this section has exceeded the chlorite MCL and the system has not been required to conduct monitoring under paragraph (b)(2)(ii) of this section. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken monthly in the distribution system under paragraph (b)(2)(i)(B) of this section exceeds the chlorite MCL or the system is required to conduct monitoring under paragraph (b)(2)(ii) of this section, at which time the system must revert to routine monitoring.

(3) Bromate. (i) Routine monitoring. Community and nontransient noncommunity systems using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. Systems must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

(ii) Reduced monitoring. Systems required to analyze for bromate may reduce monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is ≥ 0.05 mg/L, the system must resume routine monitoring required by paragraph (b)(3)(i) of this section.

(c) Monitoring requirements for disinfectant residuals.

(1) Chlorine and chloramines. (i) Routine monitoring. Community and nontransient noncommunity water systems that use chlorine or chloramines must measure the residual disinfectant level in distribution system when total coliforms are sampled, as specified in §141.21. Subpart H systems may use the results of residual disinfectant concentration sampling conducted under §141.74(b)(6)(i) for unfiltered systems or §141.74(c)(3)(i) for systems which filter, in lieu of taking separate samples.

(ii) Reduced monitoring. Monitoring may not be reduced.

(2) Chlorine Dioxide. (i) Routine monitoring. Community, nontransient noncommunity, and transient noncommunity water systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by paragraph (c)(2)(ii) of this section, in addition to the sample required at the entrance to the distribution system.

(ii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples. If chlorine dioxide

or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

(iii) Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

(d) Monitoring requirements for disinfection byproduct precursors (DBPP).

(1) Routine monitoring. Subpart H systems which use conventional filtration treatment (as defined in §141.2) must monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All systems required to monitor under this paragraph (d)(1) must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time as the source water sample is taken, all systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

(2) Reduced monitoring. Subpart H systems with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC ≥ 2.0 mg/L.

(e) Bromide. Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

(f) Monitoring plans. Each system required to monitor under this subpart must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the State and the general public no later than 30 days following the applicable compliance dates in §141.130(b). All Subpart H systems serving more than 3300 people must submit a copy of the monitoring plan to the State no later than the date of the first report required under §141.134. The State may also require the plan to be submitted by any other system. After review, the State may require changes in any plan elements. The plan must include at least the following elements.

(1) Specific locations and schedules for collecting samples for any parameters included in this subpart.

(2) How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.

(3) If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of §141.29, the sampling plan must reflect the entire distribution system.

§141.133 Compliance requirements.

(a) General requirements. (1) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

(2) All samples taken and analyzed under the provisions of this subpart must be included in determining compliance, even if that number is greater than the minimum required.

(3) If, during the first year of monitoring under §141.132, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

(b) Disinfection byproducts.

(1) TTHMs and HAA5. (i) For systems monitoring quarterly, compliance with MCLs in §141.64 must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by §141.132(b)(1).

(ii) For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of §141.132(b)(1) does not exceed the MCLs in §141.64. If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and such a system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase monitoring frequency to quarterly monitoring must calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.

(iii) If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to §141.32 or §141.32, whichever is effective for your system, in addition to reporting to the State pursuant to §141.134.

(iv) If a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(2). Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by §141.132(b)(3). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to §141.32, in addition to reporting to the State pursuant to §141.134. If a PWS fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(3). Chlorite. Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by §141.132(b)(2)(i)(B) and §141.132(b)(2)(ii). If the arithmetic average of any three sample sets exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to subpart Q, in addition to reporting to the State pursuant to §141.134.

(c) Disinfectant residuals.

(1) Chlorine and chloramines. (i) Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under §141.132(c)(1). If the average of quarterly averages covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to §141.32, in addition to reporting to the State pursuant to §141.134.

(ii) In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to §141.134 must clearly indicate which residual disinfectant was analyzed for each sample.

(2) Chlorine dioxide. (i) Acute violations. Compliance must be based on consecutive daily samples collected by the system under §141.132(c)(2). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public pursuant to the procedures for acute health risks in subpart Q. Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for acute violations under subpart Q in addition to reporting the State pursuant to §141.134.

(ii) Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under §141.132(c)(2). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health risks in subpart Q in addition to reporting the State pursuant to §141.134. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for nonacute violations under §141.32(e)(78) in addition to reporting the State pursuant to §141.134.

(d) Disinfection Byproduct Precursors (DBPP). Compliance must be determined as specified by §141.135(c). Systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in §141.135(b)(2) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to §141.135(b)(3) and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For systems required to meet Step 1 TOC removals, if the value calculated under §141.135(c)(1)(iv) is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to §141.32, in addition to reporting to the State pursuant to §141.134.

§141.134 Reporting and recordkeeping requirements.

(a) Systems required to sample quarterly or more frequently must report to the State within 10 days after the end of each quarter in which samples were collected, notwithstanding the provisions of §141.31. Systems required to sample less frequently than quarterly must report to the State within 10 days after the end of each monitoring period in which samples were collected.

(b) Disinfection byproducts. Systems must report the information specified in the following table:

IF YOU ARE A...

(1) System monitoring for TTHMs and HAA5 under the requirements of §141.132(b) on a quarterly or more frequent basis.

(2) System monitoring for TTHMs and HAA5 under the requirements of §141.132(b) less frequently than quarterly (but at least annually).

(3) System monitoring for TTHMs and HAA5 under the requirements of §141.132(b) less frequently than annually.

(4) System monitoring for chlorite under the requirements of §141.132(b).

(5) System monitoring for bromate under the requirements of §141.132(b)

YOU MUST REPORT...¹

- (i) The number of samples taken during the last quarter.
- (ii) The location, date, and result of each sample taken during the last quarter.
- (iii) The arithmetic average of all samples taken in the last quarter.
- (iv) The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters.
- (V) Whether, based on §141.133(b)(1), the MCL was violated.

- (i) The number of samples taken during the last year.
- (ii) The location, date, and result of each sample taken during the last monitoring period.
- (iii) The arithmetic average of all samples taken over the last year.
- (iv) Whether, based on §141.133(b)(1), the MCL was violated.

- (i) The location, date, and result of the last sample taken.
- (ii) Whether, based on §141.133(b)(1), the MCL was violated.

- (i) The number of entry point samples taken each month for the last 3 months.
- (ii) The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter.
- (iii) For each month in the reporting period, the arithmetic average of all samples taken in each three sample set taken in the distribution system.
- (4) Whether, based on §141.133(b)(3), the MCL was violated, and in which month, and how many times it was violated each month.

- (i) The number of samples taken during the last quarter.
- (ii) The location, date, and result of each sample taken during the last quarter.
- (iii) The arithmetic average of the monthly arithmetic averages of all samples taken in the last year.
- (iv) Whether, based on §141.133(b)(2), the MCL was violated.

¹ The State may choose to perform calculations and determine whether the MCL was exceeded, in lieu of having the system report that information.

(c) Disinfectants. Systems must report the information specified in the following table:

IF YOU ARE A...

YOU MUST REPORT...¹

System monitoring for chlorine or chloramines under the requirements of §141.132(c)

- (1) The number of samples taken during each month of the last quarter.
- (2) The monthly arithmetic average of all samples taken in each month for the last 12 months.
- (3) The arithmetic average of all monthly averages for the last 12 months.
- (4) Whether, based on §141.133(c)(1), the MRDL was violated.

System monitoring for chlorine dioxide under the requirements of §141.132(c)

- (1) The dates, results, and locations of samples taken during the last quarter.
- (2) Whether, based on §141.133(c)(2), the MRDL was violated.
- (3) Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

¹ The State may choose to perform calculations and determine whether the MRDL was exceeded, in lieu of having the system report that information.

(d) Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Systems must report the information specified in the following table:

IF YOU ARE A...

System monitoring monthly or quarterly for TOC under the requirements of §141.132(d) and required to meet the enhanced coagulation or enhanced softening requirements in §141.135(b)(2) or (3)

System monitoring monthly or quarterly for TOC under the requirements of §141.132(d) and meeting one or more of the alternative compliance criteria in §141.135(a)(2) or (3)

YOU MUST REPORT...¹

- (1) The number of paired (source water and treated water) samples taken during the last quarter.
- (2) The location, date, and results of each paired sample and associated alkalinity taken during the last quarter.
- (3) For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal.
- (4) Calculations for determining compliance with the TOC percent removal requirements, as provided in §141.135(c)(1).
- (5) Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in §141.135(b) for the last four quarters.

- (1) The alternative compliance criterion that the system is using.
- (2) The number of paired samples taken during the last quarter.
- (3) The location, date, and result of each paired sample and associated alkalinity taken during the last quarter.
- (4) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in §141.135(a)(2)(i) or (iii) or of treated water TOC for systems meeting the criterion in §141.135(a)(2)(ii).
- (5) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in §141.135(a)(2)(v) or of treated water SUVA for systems meeting the criterion in §141.135(a)(2)(vi).
- (6) The running annual average of source water alkalinity for systems meeting the criterion in §141.135(a)(2)(iii) and of treated water alkalinity for systems meeting the criterion in §141.135(a)(3)(i).
- (7) The running annual average for both TTHM and HAA5 for systems meeting the criterion in §141.135(a)(2)(iii) or (iv).
- (8) The running annual average of the amount of magnesium hardness removal (as CaCO₃, in mg/L) for systems meeting the criterion in §141.135(a)(3)(ii).
- (9) Whether the system is in compliance with the particular alternative compliance criterion in §141.135(a)(2) or (3).

¹. The State may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the system report that information.

§141.135 Treatment technique for control of disinfection byproduct (DBP) precursors.

(a) Applicability. (1) Subpart H systems using conventional filtration treatment (as defined in §141.2) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in paragraph (b) of this section unless the system meets at least one of the alternative compliance criteria listed in paragraph (a)(2) or (a)(3) of this section.

(2) Alternative compliance criteria for enhanced coagulation and enhanced softening systems. Subpart H systems using conventional filtration treatment may use the alternative compliance criteria in paragraphs (a)(2)(i) through (vi) of this section to comply with this section in lieu of complying with paragraph (b) of this section. Systems must still comply with monitoring requirements in §141.132(d).

(i) The system's source water TOC level, measured according to §141.131(d)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average.

(ii) The system's treated water TOC level, measured according to §141.131(d)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average

(iii) The system's source water TOC level, measured according to §141.131(d)(3), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to §141.131(d)(1), is greater than 60 mg/L (as CaCO_3), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in §141.130(b), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in §141.130(b) to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the State for approval not later than the effective date for compliance in §141.130(b). These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation of National Primary Drinking Water Regulations.

(iv) The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(v) The system's source water SUVA, prior to any treatment and measured monthly according to §141.131(d)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(vi) The system's finished water SUVA, measured monthly according to §141.131(d)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(3) Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by paragraph (b)(2) of this section may use the alternative compliance criteria in paragraphs (a)(3)(i) and (ii) of this section in lieu of complying with paragraph (b) of this section. Systems must still comply with monitoring requirements in §141.132(d).

(i) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO_3), measured monthly according to §141.131(d)(1) and calculated quarterly as a running annual average.

(ii) Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO_3), measured monthly and calculated quarterly as an annual running average.

(b) Enhanced coagulation and enhanced softening performance requirements.

(1) Systems must achieve the percent reduction of TOC specified in paragraph (b)(2) of this section between the source water and the combined filter effluent, unless the State approves a system's request for alternate minimum TOC removal (Step 2) requirements under paragraph (b)(3) of this section.

(2) Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with §141.131(d). Systems practicing softening are required to meet the Step 1 TOC reductions in the far-right column (Source water alkalinity >120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Subpart H Systems Using Conventional Treatment^{1, 2}

Source-Water TOC, mg/L	Source-Water Alkalinity, mg/L as CaCO ₃		
	0-60 (percent)	>60-120 (percent)	>120 ³ (percent)
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

¹Systems meeting at least one of the conditions in paragraph (a)(2)(i)-(vi) of this section are not required to operate with enhanced coagulation.

² Softening systems meeting one of the alternative compliance criteria in paragraph (a)(3) of this section are not required to operate with enhanced softening.

³Systems practicing softening must meet the TOC removal requirements in this column.

(3) Subpart H conventional treatment systems that cannot achieve the Step 1 TOC removals required by paragraph (b)(2) of this section due to water quality parameters or operational constraints must apply to the State, within three months of failure to achieve the TOC removals required by paragraph (b)(2) of this section, for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the State approves the alternative minimum TOC removal (Step 2) requirements, the State may make those requirements retroactive for the purposes of determining compliance. Until the State approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the Step 1 TOC removals contained in paragraph (b)(2) of this section.

(4) Alternate minimum TOC removal (Step 2) requirements. Applications made to the State by enhanced coagulation systems for approval of alternate minimum TOC removal (Step 2) requirements under paragraph (b)(3) of this section must include, at a minimum, results of bench- or pilot-scale testing conducted under paragraph (b)(4)(i) of this section. The submitted bench- or pilot- scale testing must be used to determine the alternate enhanced coagulation level.

(i) Alternate enhanced coagulation level is defined as:

Coagulation at a coagulant dose and pH as determined by the method described in paragraphs (b)(4)(i) through (v) of this section such that an incremental addition of 10 mg/L of alum (or equivalent amount of ferric salt) results in a TOC removal of ≤ 0.3 mg/L. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the system. Once approved by the State, this minimum requirement supersedes the minimum TOC removal required by the table in paragraph (b)(2) of this section. This requirement will be effective until such time as the State approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve State-set alternative minimum TOC removal levels is a violation of National Primary Drinking Water Regulations.

(ii) Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

ENHANCED COAGULATION STEP 2 TARGET pH

ALKALINITY (mg/L as CaCO ₃)	TARGET pH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

(iii) For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (or equivalent addition of iron coagulant) is reached.

(iv) The system may operate at any coagulant dose or pH necessary (consistent with other NPDWRs) to achieve the minimum TOC percent removal approved under paragraph (b)(3) of this section.

(v) If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the State for a waiver of enhanced coagulation requirements.

(c) Compliance Calculations. (1) Subpart H systems other than those identified in paragraphs (a)(2) or (a)(3) of this section must comply with requirements contained in paragraphs (b)(2) or (b)(3) of this section. Systems must calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:

(i) Determine actual monthly TOC percent removal, equal to:

$$(1 - (\text{treated water TOC} / \text{source water TOC})) \times 100.$$

(ii) Determine the required monthly TOC percent removal (from either the table in paragraph (b)(2) of this section or from paragraph (b)(3) of this section).

(iii) Divide the value in paragraph (c)(1)(i) of this section by the value in paragraph (c)(1)(ii) of this section.

(iv) Add together the results of paragraph (c)(1)(iii) of this section for the last 12 months and divide by 12.

(v) If the value calculated in paragraph (c)(1)(iv) of this section is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

(2) Systems may use the provisions in paragraphs (c)(2)(i) through (v) of this section in lieu of the calculations in paragraph (c)(1)(i) through (v) of this section to determine compliance with TOC percent removal requirements.

(i) In any month that the system's treated or source water TOC level, measured according to §141.131(d)(3), is less than 2.0 mg/L, the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(ii) In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness (as CaCO₃), the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(iii) In any month that the system's source water SUVA, prior to any treatment and measured according to §141.131(d)(4), is ≤ 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(iv) In any month that the system's finished water SUVA, measured according to §141.131(d)(4), is ≤ 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(v) In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/L (as CaCO₃), the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(3) Subpart H systems using conventional treatment may also comply with the requirements of this section by meeting the criteria in paragraph (a)(2) or (3) of this section.

(d) Treatment Technique Requirements for DBP Precursors. The Administrator identifies the following as treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems: For Subpart H systems using conventional treatment, enhanced coagulation or enhanced softening.

11. Section 141.154 is amended by adding paragraph (e) to read as follows:

§141.154 Required additional health information.

* * * * *

(e) Community water systems that detect TTHM above 0.080 mg/l, but below the MCL in §141.12, as an annual average, monitored and calculated under the provisions of §141.30, must include health effects language prescribed by paragraph (73) of appendix C to subpart O.

PART 142 -- NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

12. The authority citation for Part 142 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

13. Section 142.14 is amended by adding new paragraphs (d)(12), (d)(13), (d)(14), (d)(15), and (d)(16) to read as follows.

§142.14 Records kept by States.

* * * * *

(d) * * *

(12) Records of the currently applicable or most recent State determinations, including all supporting information and an explanation of the technical basis for each decision, made under the following provisions of 40 CFR part 141, subpart L for the control of disinfectants and disinfection byproducts. These records must also include interim measures toward installation.

(i) States must keep records of systems that are installing GAC or membrane technology in accordance with §141.64(b)(2) of this chapter. These records must include the date by which the system is required to have completed installation.

(ii) States must keep records of systems that are required, by the State, to meet alternative minimum TOC removal requirements or for whom the State has determined that the source water is not amenable to enhanced coagulation in accordance with §141.135(b)(3) and (4) of this chapter, respectively. These records must include the alternative limits and rationale for establishing the alternative limits.

(iii) States must keep records of subpart H systems using conventional treatment meeting any of the alternative compliance criteria in §141.135(a)(2) or (3) of this chapter.

(iv) States must keep a register of qualified operators that have met the State requirements developed under §142.16(f)(2).

(13) Records of systems with multiple wells considered to be one treatment plant in accordance with §141.132(a)(2) of this chapter and §142.16(f)(5).

(14) Monitoring plans for subpart H systems serving more than 3,300 persons in accordance with §141.132(f) of this chapter.

(15) List of laboratories approved for analyses in accordance with §141.131(b) of this chapter.

(16) List of systems required to monitor for disinfectants and disinfection byproducts in accordance with part 141, subpart L of this chapter. The list must indicate what disinfectants and DBPs, other than chlorine, TTHM, and HAA5, if any, are measured.

* * * * *

14. Section 142.16 is amended by adding paragraph (h) to read as follows.

§142.16 Special primacy requirements.

* * * * *

(h) Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements:

(1) Section 141.64(b)(2) of this chapter (interim treatment requirements). Determine any interim treatment requirements for those systems electing to install GAC or membrane filtration and granted additional time to comply with §141.64 of this chapter.

(2) Section 141.130(c) of this chapter (qualification of operators). Qualify operators of public water systems subject to 40 CFR part 141, subpart L. Qualification requirements established for operators of systems subject to 40 CFR part 141, subpart H - Filtration and Disinfection may be used in whole or in part to establish operator qualification requirements for meeting 40 CFR part 141, subpart L requirements if the State determines that the 40 CFR part 141, subpart H requirements are appropriate and applicable for meeting subpart L requirements.

(3) Section 141.131(c)(2) of this chapter (DPD colorimetric test kits). Approve DPD colorimetric test kits for free and total chlorine measurements. State approval granted under §141.74(a)(2) of this chapter for the use of DPD colorimetric test kits for free chlorine testing is acceptable for the use of DPD test kits in measuring free chlorine residuals as required in 40 CFR part 141, subpart L.

(4) Sections 141.131(c)(3) and (d) of this chapter (State approval of parties to conduct analyses). Approve parties to conduct pH, bromide, alkalinity, and residual disinfectant concentration measurements. The State's process for approving parties performing water quality measurements for systems subject to 40 CFR part 141, subpart H requirements in paragraph (b)(2)(i)(D) of this section may be used for approving parties measuring water quality parameters for systems subject to subpart L requirements, if the State determines the process is appropriate and applicable.

(5) Section 141.132(a)(2) of this chapter (multiple wells as a single source). Define the criteria to use to determine if multiple wells are being drawn from a single aquifer and therefore be considered a single source for compliance with monitoring requirements.

(6) Approve alternate minimum TOC removal (Step 2) requirements, as allowed under the provisions of §141.135(b) of this chapter.

Appendix F

Examples of Stage 1 DBPR Monitoring Forms for States

This appendix contains example monitoring forms that may be helpful if your state is developing monitoring forms for the Stage 1 DBPR. These examples are provided for demonstration purposes only. Therefore, instructions for completing the forms are not provided.

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Examples of Selected Quarterly Reports

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State of Texas

D.	Sample Monthly TOC Removal Report	11
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A. Sample Generic Quarterly Report Format
(Based on Submission From the State of Wyoming - see next page for ideas on use.)

**Quarterly Report to the Primacy Agency for the Running Annual Average (RAA)
for [insert constituent].**

Date: _____ System/Treatment Plant _____
PWSID # _____ Filtration Technology _____
Prepared By _____ (Include laboratory results from the last quarter.)

Column #1 Check one 1 st Quarter _____ (report by April 10 th) 2 nd Quarter _____ (report by July 10 th) 3 rd Quarter _____ (report by Oct 10 th) 4 th Quarter _____ (report by Jan 10 th)	Column #2 <u>[insert constituent]</u> Monthly Data <u>[insert units]*</u>	Column #3 <u>[insert constituent]</u> Quarterly Average <u>[insert units]**</u>	Column #4 <u>[insert constituent]</u> Running Annual Average <u>[insert units]***</u>
January of 20__			
February of 20__			
March of 20__			
April of 20__			
May of 20__			
June of 20__			
July of 20__			
August of 20__			
September of 20__			
October of 20__			
November of 20__			
December of 20__			

*This sample is the average of all samples taken during the month

**Calculation of Quarterly Average: If the number for Jan. was 1.5 mg/L, Feb. was 1.9 mg/L and March was 1.1 mg/L then, add all three numbers up and divide by 3. For example, $\frac{1.5 + 1.9 + 1.1}{3} = 1.5$ mg/L (this is your quarterly average.)

***Calculation of Running Annual Average: If the number for quarterly average for the 1st quarter was 1.5 mg/L, quarterly average for the 2nd quarter was 1.2 mg/L, quarterly average for the 3rd quarter was 1.1 mg/L and quarterly average for the 4th quarter was 1.8 mg/L then, add all four quarterly average numbers up and divide this time by 4. For example, $\frac{1.5 + 1.2 + 1.1 + 1.8}{4} = 1.4$ mg/L (this is your running annual average.)

4

EXAMPLES OF CONSTITUENTS FOR GENERIC FORMAT

The previous Sample Generic Quarterly Report may be used for a variety of reports, including submissions for alternative compliance criteria. Constituents that can be inserted may include:

- Chlorine
- Chloramines
- Bromate for systems using ozone
- Haloacetic Acids Five
- Total Trihalomethanes
- Source Water Bromide for systems using ozone to reduce monitoring for bromate
- Finished Water Alkalinity
- Source Water Alkalinity
- Finished Water SUVA
- Source Water SUVA
- Source Water Total Organic Carbon
- Finished Water Total Organic Carbon
- Finished Water Total Organic Carbon for Reduced Monitoring of Source Water Alkalinity and TOC and Finished Water TOC
- Magnesium Removed
- Ratio of TOC Removed

See examples from the State of Wyoming on the following pages using the generic format. Please note there may be exceptions to the generic form.

Some of these quarterly reports may also be used in conjunction with worksheets to assist in calculations. See the next section for examples of selected worksheets.

B. Sample Quarterly Report for TOC Removed From the State of Wyoming
(May be used in conjunction with worksheet. See page F-18 for accompanying worksheet.)

**Quarterly Report to the Primacy Agency for the Running Annual Average (RAA)
for Total Organic Carbon Removed**

(PWSs utilizing conventional treatment must maintain a RAA of greater than 1.00 for the ratio of TOC removed to be in compliance.)

Date: _____ System/Treatment Plant _____
PWSID # _____ Filtration Technology _____
Prepared By _____ (Include laboratory results from the last quarter.)

Column #1 Check one 1 st Quarter _____ (report by April 10 th) 2 nd Quarter _____ (report by July 10 th) 3 rd Quarter _____ (report by Oct 10 th) 4 th Quarter _____ (report by Jan. 10 th)	Ratio of TOC Removed Monthly Data (from column F of the 1st page of this report)	Ratio of TOC Removed Quarterly Average (mg/L)*	Ratio of TOC Removed Running Annual Average (mg/L)**
January of 20__			
February of 20__			
March of 20__			
April of 20__			
May of 20__			
June of 20__			
July of 20__			
August of 20__			
September of 20__			
October of 20__			
November of 20__			
December of 20__			

*Calculation of Quarterly Average: If the number for Jan. was 1.5 mg/L, Feb. was 1.9 mg/L and March was 1.1 mg/L then, add all three numbers up and divide by 3. For example, $(1.5 + 1.9 + 1.1) = 1.5 \text{ mg/L}$ (this is your quarterly average.)
3

**Calculation of Running Annual Average: If the number for quarterly average for the 1st quarter was 1.5 mg/L, quarterly average for the 2nd quarter was 1.2 mg/L, quarterly average for the 3rd quarter was 1.1 mg/L and quarterly average for the 4th quarter was 1.8 mg/L then, add all four quarterly average numbers up and divide this time by 4. For example, $(1.5 + 1.2 + 1.1 + 1.8) = 1.4 \text{ mg/L}$ (this is your running annual average.)
4

C Sample Quarterly Report for Finished Water Magnesium Removed From the State of Wyoming

(May be used in conjunction with worksheet. See page F-19 for accompanying worksheet.)

Additional Alternative Compliance Criteria for Softening Systems #2 Quarterly Report to the Primacy Agency for the Running Annual Average (RAA) for Finished Water Magnesium Removed

(For a PWS that practices softening that cannot meet the TOC removal requirements for enhanced coagulation and chooses this additional alternative compliance criteria must maintain a RAA of greater than 10 mg/L for magnesium removed between the source water and treated water.)

Date: _____ System/Treatment Plant _____
PWSID # _____ Filtration Technology _____
Prepared By _____ (Include laboratory results from the last quarter.)

Check one 1 st Quarter _____ (Report by April 10 th) 2 nd Quarter _____ (Report by July 10 th) 3 rd Quarter _____ (Report by Oct 10 th) 4 th Quarter _____ (Report by Jan 10 th)	Magnesium Removed Monthly Data (mg/L)* (from column C of page 1 of this report)	Magnesium Removed Quarterly Average (mg/L)**	Magnesium Removed Running Annual Average (mg/L)***
January of 20__			
February of 20__			
March of 20__			
April of 20__			
May of 20__			
June of 20__			
July of 20__			
August of 20__			
September of 20__			
October of 20__			
November of 20__			
December of 20__			

*Samples must be taken at the source prior to treatment and after treatment to determine the amount of magnesium removed, see page 1 of this report.

**Calculation of Quarterly Average: If the number for Jan. was 1.5 mg/L, Feb. was 1.9 mg/L and March was 1.1 mg/L then, add all three numbers up and divide by 3. For example, $(1.5 + 1.9 + 1.1) = 1.5$ mg/L (this is your quarterly average.)

***Calculation of Running Annual Average: If the number for quarterly average for the 1st quarter was 1.5 mg/L, quarterly average for the 2nd quarter was 1.2 mg/L, quarterly average for the 3rd quarter was 1.1 mg/L and quarterly average for the 4th quarter was 1.8 mg/L then, add all four quarterly average numbers up and divide this time by 4. For example, $(1.5 + 1.2 + 1.1 + 1.8) = 1.4$ mg/L (this is your running annual average.)

D. Sample Monthly TOC Removal Report From the State of Texas

MONTHLY TOTAL ORGANIC CARBON REMOVAL REPORT (TOC-MOR) FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER
SYSTEM NAME: _____

PLANT NAME OR NUMBER: _____

PWS ID No.: _____

Month: _____

Year: _____

Type of treatment: _____

☐ Conventional

☐ Unconventional

explain: _____

Note: Systems are required to run one TOC Sample Set every month. Additional space is provided for those systems that do additional sampling

Date	Monthly TOC Sample Set			Actual % TOC Removed <small>calculated</small>	Step 1 Required % Removal <small>from matrix</small>	Step 1 Removal RATIO <small>calculated</small>	Optional data			COMPLIANCE REMOVAL RATIO <small>calculated</small>	
	Raw Alkalinity	Raw TOC	Treated TOC				Step 2 Required % Removal	Step 2 Removal Ratio <small>calculated</small>	ACC # used <small>attach ACCform</small>		ACC Removal Ratio <small>calculated</small>
	Required plant data						<small>attach Step2 form</small>	<small>calculated</small>	<small>attach ACCform</small>		<small>calculated</small>
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
Avg											
Max											
Min											

TOTAL ORGANIC CARBON (TOC) REMOVAL SUMMARY

TOC Summary			TOC % Removal Summary		TOC Removal Ratio
Raw Water Alkalinity	Raw Water TOC	Treated Water TOC	TOC % Removal	Requirement	

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____

Certificate
No. and Grade: _____

Date: _____

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Examples of Worksheets
(These May Be Used in Conjunction with Quarterly Reports)

State of Wyoming

A.	Sample Chlorine/Chloramine Residual Worksheet	15
B.	Sample TTHM Worksheet	16
C.	Sample HAA5 Worksheet	17
D.	Sample TOC Removed Worksheet	18
E.	Sample Finished Water Magnesium Removed Worksheet	19
F.	Sample Source Water Alkalinity and TOC and Finished Water TOC for Those Systems on an Alternative Compliance Criteria Worksheet	20

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A. Sample Chlorine/Chloramine Residual Worksheet From the State of Wyoming

Chlorine/Chloramine Residual Worksheet

(This worksheet is provided to assist a system in calculating the average of all chlorine or chloramine residual levels recorded during total coliform sampling during the month. Each row will contain only one residual level and will be located under one of the following headings: routine, repeat, increased routine or other compliance total coliform sample. The number from this row will be carried over to column F and summed on the second to last row of the table. The number calculated at the bottom right of this table is the average of all the months residual levels and is the number that is entered for that month in the second column of the chlorine/chloramine RAA monitoring form.)

Month _____ Year _____

A # of Samples (1, 2, 3, etc.)	B Chlorine/ Chloramine Level Recorded for Routine Total Coliform Sample (mg/L)	C Chlorine/ Chloramine Level Recorded for Repeat Total Coliform Sample (mg/L)	D Chlorine/ Chloramine Level Recorded for Increased Routine Total Coliform Sample (mg/L)	E Chlorine/ Chloramine Level Recorded for Other Compliance Total Coliform Sample (mg/L)	F Carry the Chlorine/ Chloramine Level in B, or C, or D, or E to this column (mg/L) (there should be only one sample per row)
Add all the numbers in column F and enter the sum here>>					
Calculate the average of all residual levels for the month by dividing the sum of column F by the total number of samples in column A (F/A). Enter this average into the 2 nd column of the monitoring form for calculating the RAA for chlorine/chloramines.					

The monitoring forms for compliance with chlorine dioxide and chlorite are:

- 1 Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling for Systems using Chlorine Dioxide.
- 2 Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (no chlorine booster station) for Systems using Chlorine Dioxide.
- 3 Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (with a chlorine booster station) for Systems using Chlorine Dioxide.

B. Sample TTHM Worksheet From the State of Wyoming

TTHM Worksheet

(This worksheet is provided to assist a system in calculating the average of all TTHM samples that were taken during the month when more than one sample is required. The number calculated at the bottom right of this form is the average of all the months samples and is the number that is entered for that month in the second column of the TTHM RAA monitoring form.)

Month _____ Year _____

A # of Samples (1, 2, 3, etc.)	B Chloroform (mg/L)	C Bromoform (mg/L)	D Bromodichloro methane (mg/L)	E Dibromochloro methane (mg/L)	F TTHMs (mg/L) (B+C+D+E)
Add all the numbers in column F for TTHMs and enter the sum here>>					
Calculate the average of all samples for the month by dividing the sum of column F by the total number of samples in column A (F/A). Enter this average into the 2 nd column of the monitoring form for calculating the RAA for TTHMs.					

C. Sample HAA5 Worksheet From the State of Wyoming

HAA5 Worksheet

(This worksheet is provided to assist a system in calculating the average of all HAA5 samples that were taken during the month when more than one sample is required. The number calculated at the bottom right of this form is the average of all the months samples and is the number that is entered for that month in the second column of the HAA5 RAA monitoring form.)

Month _____ Year _____

A # of Samples (1, 2, 3, etc.)	B Monochloro acetic acid (mg/L)	C Dichloro acetic acid (mg/L)	D Trichloro acetic acid (mg/L)	E Monobromo acetic acid (mg/L)	F Dibromo acetic acid (mg/L)	G HAA5 (mg/L) (B+C+D+E +F)
Add all the numbers in column G for HAA5s and enter the sum here>>						
Calculate the average of all samples for the month by dividing the sum of column G by the total number of samples in column A (G/A). Enter this average into the 2 nd column of the monitoring form for calculating the RAA for HAA5s.						

D. Sample TOC Removed Worksheet From the State of Wyoming
(To be used in conjunction with quarterly report.)

**Quarterly Report to the Primacy Agency for the Running Annual Average (RAA)
for Total Organic Carbon Removed**

(PWSs utilizing conventional treatment must maintain a RAA of greater than 1.00 for the ratio of TOC removed to be in compliance.)

Has reduced monitoring been granted for source water alkalinity and TOC and finished water TOC (yes/no)? _____

Alternative Minimum TOC Removal Step 2 (if applicable) _____ (substitute this # in column C)

Date: _____ System/Treatment Plant _____

PWSID # _____ Filtration Technology _____

Prepared By _____ (Include laboratory results from the last quarter.)

Months of 20__	A Alkalinity Source mg/L*	B TOC Source mg/L*	C Percent TOC Removed (from table)	D TOC Finished (mg/L)*	E Actual TOC Removed $(1-(D/B)) \times 100$	F Ratio of TOC Removed E/C**
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

*Samples for alkalinity and TOC at the source must be taken prior to any treatment including disinfectant application and finished water TOC sample must be taken at the combined filter effluent and prior to the addition of disinfectants (if possible). All three of these samples must be taken on the same hour of the same day.

**Transfer this data to the 2nd page of this report to column 2 entitled "Ratio of TOC Removed Monthly Data" and calculate the RAA of the percent TOC removed. If it benefits the PWS, in any month that the system's source or treated water TOC is less than 2.0 mg/L, the source or treated water SUVA is less than or equal to 2.0 L/mg-m or a system that practicing softening removes at least 10 mg/L of magnesium hardness or lowers the alkalinity below 60 mg/L the system may assign a monthly value of 1.0 in lieu of the calculated value. A system able to meet any one of the six alternative compliance criteria is required to report the source water alkalinity and TOC and finished water TOC but not required to perform the TOC removal calculation.

E. Sample Finished Water Magnesium Removed Worksheet From the State of Wyoming
(To be used in conjunction with quarterly report.)

Additional Alternative Compliance Criteria for Softening Systems #2
Quarterly Report to the Primacy Agency for the Running Annual Average (RAA)
for Finished Water Magnesium Removed.

(For a PWS that practices softening that cannot meet the TOC removal requirements for enhanced coagulation and chooses this additional alternative compliance criteria must calculate the amount of magnesium removed between the source water prior to any treatment and the finished water. The PWS must also report quarterly, the monthly levels of source water alkalinity and TOC and finished water TOC.)

Date: _____ System/Treatment Plant _____
PWSID # _____ Filtration Technology _____
Prepared By _____ (Include laboratory results from the last quarter.)

Months of 20__	A Source Water Magnesium (mg/L)*	B Finished Water Magnesium (mg/L)**	C Magnesium Removed (mg/L)*** (A-B)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

*Sample must be taken at the source prior to treatment

**Sample must be taken after treatment

***Transfer this number to page two of this report to column 2 entitled "Magnesium Removed Monthly Data" for calculating the RAA of magnesium removed.

F. Sample Source Water Alkalinity and TOC and Finished Water TOC for Those Systems on an Alternative Compliance Criteria Worksheet From the State of Wyoming

Quarterly Report to the Primacy Agency for Source Water Alkalinity and Total Organic Carbon (TOC) and Finished Water TOC for those Systems on an Alternative Compliance Criteria.

(Conventional PWSs utilizing an alternative compliance criteria must also report source water alkalinity and TOC and finished water TOC. Systems on reduced monitoring from monthly to quarterly must also submit the report on the RAA of the finished water TOC.)

Requirements for Reduced Monitoring have been met (yes/no) _____

Date: _____ System/Treatment Plant _____

PWSID # _____ Filtration Technology _____

Prepared By _____ (Include laboratory results from the last quarter.)

Months of 20__	Alkalinity Source mg/L*	TOC Source mg/L*	TOC Treated mg/L*
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

*If the system is on reduced monitoring then only one sample of each is required per quarter. Samples for alkalinity and TOC at the source must be taken prior to any treatment including disinfectant application and finished water TOC sample must be taken at the combined filter effluent and prior to the addition of disinfectants (if possible). All three of these samples must be taken on the same hour of the same day.

**Examples for Systems Using Chlorine Dioxide
(These May Be Used in Conjunction with Quarterly Reports)**

State of Wyoming

- A. Sample Quarterly Report for Daily Chlorine Dioxide Sampling with a Chlorine Booster Station . . . 23
- B. Sample Quarterly Report for Daily Chlorine Dioxide Sampling with No Chlorine Booster Station 24
- C. Sample Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling 24

State of Texas

- D. Sample Chlorine Dioxide Monthly Operating Report 25

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A. Sample Quarterly Report for Daily Chlorine Dioxide Sampling with a Chlorine Booster Station From the State of Wyoming

Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (with a chlorine booster station) for Systems using Chlorine Dioxide)

(The PWS must monitor for chlorine dioxide daily at the entrance of the dist. system. Two consecutive daily samples exceeding 0.8 mg/L or failure to monitor a daily sample after exceeding 0.8 mg/L in a daily sample is a nonacute violation. A PWS exceeding the daily chlorine dioxide level of 0.8 mg/L must take a 3-sample set in the dist. system the following day at the first customer, average and maximum residence time. If any one of the three samples taken in the dist. system exceed 0.8 mg/L, it is an acute violation.)

Date: _____ System/Treatment Plant _____

PWSID # _____ Filtration Technology _____

Prepared By _____ (Include laboratory results from the last quarter.)

Year _____ Month _____	ClO ₂ Daily Data (mg/L)	ClO ₂ Dist. First Customer (mg/L)	ClO ₂ Dist. Average Residence time (mg/L)	ClO ₂ Dist. Maximum Residence Time (mg/L)	ClO ₂ Dist. Highest Level (mg/L)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
...					
25					
26					
27					
28					
29					
30					
31					

B. Sample Quarterly Report for Daily Chlorine Dioxide Sampling with No Chlorine Booster Station From the State of Wyoming

Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (no chlorine booster station) for Systems using Chlorine Dioxide.

(The PWS must monitor for chlorine dioxide daily at the entrance of the dist. system. Two consecutive daily samples exceeding 0.8 mg/L or failure to monitor a daily sample after exceeding 0.8 mg/L in a daily sample is a nonacute violation. A PWS exceeding the daily chlorine dioxide level of 0.8 mg/L must take a 3-sample set in the dist. system the following day at the first customer at six hour intervals. If any one of the three samples taken in the dist. system exceed 0.8 mg/L, it is an acute violation.)

Date: _____ System/Treatment Plant _____

PWSID # _____ Filtration Technology _____

Prepared By _____ (Include laboratory results from the last quarter.)

Year _____ Month _____	ClO ₂ Daily Data (mg/L)	ClO ₂ Dist. First Customer at 0 Hours (mg/L)	ClO ₂ Dist. First Customer at 6 Hours (mg/L)	ClO ₂ Dist. First Customer at 12 Hours (mg/L)	ClO ₂ Dist. Highest Level (mg/L)
1					
2					
3					
⋮					
31					

C. Sample Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling

Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling (for Systems using Chlorine Dioxide).

(The PWS must monitor for chlorite daily at the entrance of the dist. system and one monthly 3-sample set in the dist system at the first customer, average and maximum residence time. A PWS exceeding the daily chlorite level of 1.0 mg/L must take an additional 3-sample set in the dist. system at the first customer, average and maximum residence time the following day. If the average of any 3-sample set exceeds 1.0 mg/L the system has a nonacute violation.) Reduced monitoring has been granted for monthly monitoring (yes/no) _____

Date: _____ System/Treatment Plant _____

PWSID # _____ Filtration Technology _____

Prepared By _____ (Include laboratory results from the last quarter.)

Year _____ Month _____	Chlorite Daily Data (mg/L)	Routine Monthly or Additional Dist. Sample	Distribution Chlorite at First Customer (mg/L)	Distribution Chlorite at Average Time (mg/L)	Distribution Chlorite at Max. Time (mg/L)	Average of Three Dist. Samples (mg/L)
1						
2						
3						
...						
31						

D. Sample Chlorine Dioxide Monthly Operating Report From the State of Texas

CHLORINE DIOXIDE MONTHLY OPERATING REPORT FOR PUBLIC WATER SYSTEMS

PWS NAME: _____

PLANT NAME
OR NUMBER: _____

PWS I.D. Number: _____

Connections: _____

Report Month: _____

Year: _____

Population: _____

DATE	ClO ₂ Used?	ClO ₂ POE	ClO ₂ Distribution			Chlorite	
			First	Sec.	Third	POE	DIST
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

Chlorite Stock Solution
g/L chlorite
g/L chlorate

BA for ClO ₂ ?
Date

Booster Chlorination	No
----------------------	----

Chlorite Distribution Monitoring
No. of Sets:

Chlorine Dioxide (ClO ₂) Violations	
	No. of Violations
Acute MRDL	
Non Acute MRDL	
Monitoring	
Public Notified?	
Date(s):	
TNRCC Notified?	
Date(s):	

Chlorite (ClO ₂) Violations	
	No. of Violations
MCL Violation TBD by the TNRCC	
Monitoring	
Public Notified?	
Date(s):	
TNRCC Notified?	
Date(s):	

GENERAL REMARKS ABOUT ClO₂ GENERATOR

DATA SUMMARY					
	ClO ₂ POE	ClO ₂ Distribution			Chlorite POE
		No. of Sets:			
		First	Sec.	Third	
# > Limit					
Max.					
Min.					
Avg.					

Total water treated this Month
MG

Sodium Chlorite used this Month
lbs.

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____

Certificate No. & Class: _____

Date: _____

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Other Reporting Forms

State of Texas

- A. Sample Alternative Compliance Criteria Report Forms 29
- B. Sample Step 2 Jar Test Report 31

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A. Sample Alternative Compliance Criteria Report Forms From the State of Texas (Page 1)

ALTERNATIVE COMPLIANCE CRITERIA REPORT
FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM
NAME: _____

PLANT NAME OR
NUMBER: _____

PWS ID No.: _____

Month _____

Year _____

This Alternative Compliance Criteria (ACC) Report is being submitted to request the following ACC: (check one)

(Put an "X" in the box that shows the number of the Alternative Compliance Criteria you are applying for)

#1 ☐ #2 ☐ #3 ☐ #4 ☐ #5 ☐ #6 ☐ #7 ☐ #8 ☐

ACC #1	Source Water TOC less than or equal to 2.0? (calculated quarterly as a running annual average)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month/Yr												
	Monthly TOC												
	Quarterly Average			#DIV/0!									
	Yearly Average												

#2	Treated Water TOC less than or equal to 2.0? (calculated quarterly as a running annual average)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month/Yr												
	Monthly TOC												
	Quarterly Average			#DIV/0!									
	Yearly Average												

#3	Treated Water TOC less than or equal to 4.0? (calculated quarterly as a running annual average)												
	AND Source water alkalinity over 60 mg/L (as CaCO3)? (calculated quarterly as a running annual average)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month/Yr												
	Monthly TOC												
	Quarterly Average TOC												
	Yearly Average TOC												
	Monthly Alkalinity												
	Quarterly Ave. Alkalinity			#DIV/0!									
		Yearly Ave. Alkalinity											
AND TTHM and HAA5 no greater than 0.040 mg/L and 0.030 mg/L, respectively?													
Yearly Average TTHM: <input type="text"/> mg/L Yearly Average HAA5: <input type="text"/> mg/L													
ATTACH COPY OF COMPLIANCE REPORT FOR DISINFECTION BY-PRODUCTS (TTHM AND HAA5)													

#4	TTHM and HAA5 no greater than 0.040 mg/L and 0.030 mg/L, respectively?											
	Yearly Average TTHM: <input type="text"/> mg/L Yearly Average HAA5: <input type="text"/> mg/L											
	ATTACH COPY OF COMPLIANCE REPORT FOR DISINFECTION BY-PRODUCTS (TTHM AND HAA5)											
	AND only chlorine is used in the whole plant and distribution system.											
I certify that for the last 12 months, only free chlorine was used as a disinfectant for primary disinfection and for maintenance of a residual in the distribution system.												
_____ Certified Operators Signature/ Certification Number/Date												

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's
Signature: _____

Certificate
No. and Grade: _____

Date: _____

A. Sample Alternative Compliance Criteria Report Forms From the State of Texas (Page 2)

ALTERNATIVE COMPLIANCE CRITERIA REPORT

FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM

NAME: _____

PLANT NAME OR

NUMBER: _____

PWS ID No.: _____

Month _____

Year _____

# 5	Source water SUVA less than or equal to 2.0 L/mg-m? (calculated quarterly as a running annual average) (Source water SUVA is the dissolved organic carbon concentration divided by the ultraviolet light absorption at 254 nanometers in the source water before any treatment of any kind. Measure monthly.)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month/Year												
	Monthly SUVA												
	Quarterly Average SUVA												

# 6	Treated water SUVA less than or equal to 2.0 L/mg-m? (calculated quarterly as a running annual average) (Treated water SUVA is the dissolved organic carbon concentration divided by the ultraviolet light absorption at 254 nanometers in the finished water before any disinfection of any kind, or measured using a finished water SUVA jar test. (See the Instruc Finished water measured: _____ In Plant _____ By Finished Water SUVA Jar Test (attach jar test report)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month-Year												
	Monthly SUVA												
	Quarterly Average SUVA												

ACC #7	Treated water alkalinity less than 60 mg/L (as CaCO₃)? (calculated quarterly as a running annual average) (softening practiced)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month-Year												
	Monthly Treated Alkalinity												
	Quarterly Ave. Treated Alk.												

Yearly Ave. Treated Alk. _____

AND cannot achieve the Step 1 TOC removal

Step 1 Compliance Summary:

TOC % Removal Summary		TOC Removal Ratio
TOC % Removal	Requirement	

# 8	Magnesium hardness removal greater than or equal to 10 mg/L (as CaCO₃)? (calculated quarterly as a running annual (softening practiced)												
		1	2	3	4	5	6	7	8	9	10	11	12
	Actual Month-Year												
	Monthly Raw Mg. Hardness												
	Monthly Treated Mg. Hardness												

Monthly Mg Removal _____

Quarterly Ave. Mg Removal _____

Yearly Ave. Mg Removal _____

AND cannot achieve the Step 1 TOC removal

Step 1 Compliance Summary:

TOC % Removal Summary		TOC Removal Ratio
TOC % Removal	Requirement	

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____

Certificate

No. and Grade: _____

Date: _____

B. Sample Step 2 Jar Test Report From the State of Texas

STEP 2 JAR TEST REPORT

FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM

NAME:

PLANT NAME

OR NUMBER:

PWS ID No.:

Month

Year

CURRENT OPERATING CONDITIONS

COAGULANT BEING USED

COAGULANT CONC.

COAGULANT FEED RATE

RAW WATER FLOW RATE

%

LBS/DAY

GPM

Maximum Allowable

Alum Dose in Jar 1:

mg/L

DOSING SOLUTION CALCULATIONS

COAGULANT USED TO MAKE
THE DOSING SOLUTION:

(Aluminum Sulfate, Ferric chloride,...)

SIZE OF THE JAR

TEST JARS:

L

Other Dry Coagulants

Coagulant

Chemical Formula

Molecular Formula

Molecular Weight

Cationic Charge

Other Liquid Coagulants

Coagulant

Chemical Formula

Molecular Formula

Molecular Weight

Cationic Charge

AMOUNT OF COAGULANT NEEDED

TO MAKE 1 L OF DOSING SOLUTION:

mls or grams

STEP 2 JAR TEST PARAMETERS

COAGULANT		BASE		MIXING CONDITIONS				
Type	Dosing Solution Concentration (g/L)	Concentration		Rapid Mix		Flocculation		Settling
		Type	(g/L)	Speed (rpm)	Duration (minutes)	Speed (rpm)	Duration (minutes)	Duration (minutes)

PERFORMANCE DATA

Jar No.	COAGULANT		BASE		Alkalinity (mg/L as CaCO ₃)	pH	TOC (mg/L)	Incremental TOC Removal (mg/L)	TOC Removal (%)
	Dose (mg/L)	Volume (mL)	Dose (mg/L)	Volume (mL)					
RAW									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's
Signature:

Certificate
No. and Grade:

Date:

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